ROTUNDA

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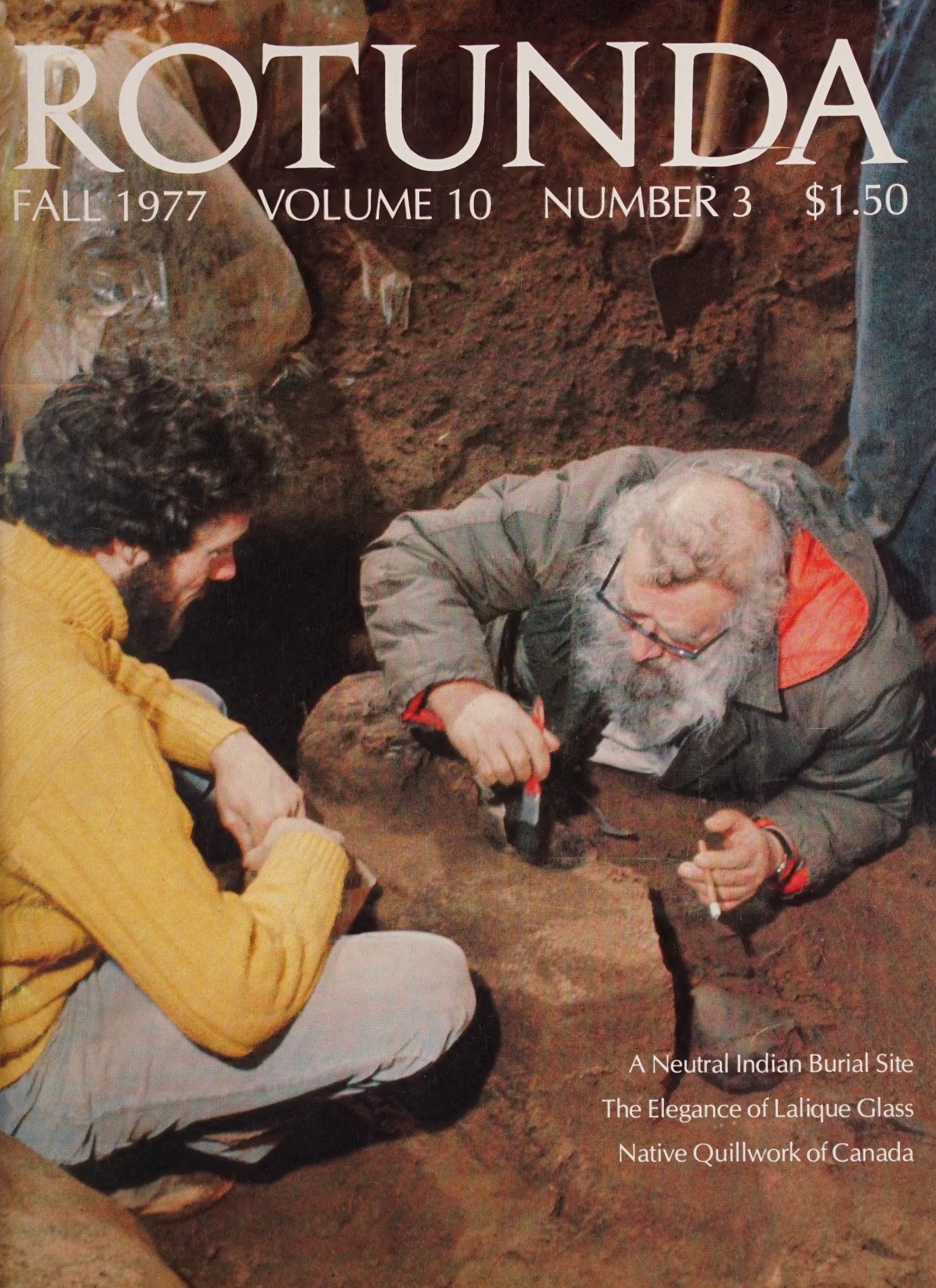

A Neutral Indian Burial Site

The Elegance of Lalique Glass

Native Quillwork of Canada

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ROTUNDA

the magazine of The Royal Ontario Museum

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A Unique and Little-Known Art

Crew member Peter Hall and archaeologist Walter Kenyon excavate a Neutral Indian burial site at Grimsby. See page 4. (Photo: Jim Chambers)

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Editorial Staff
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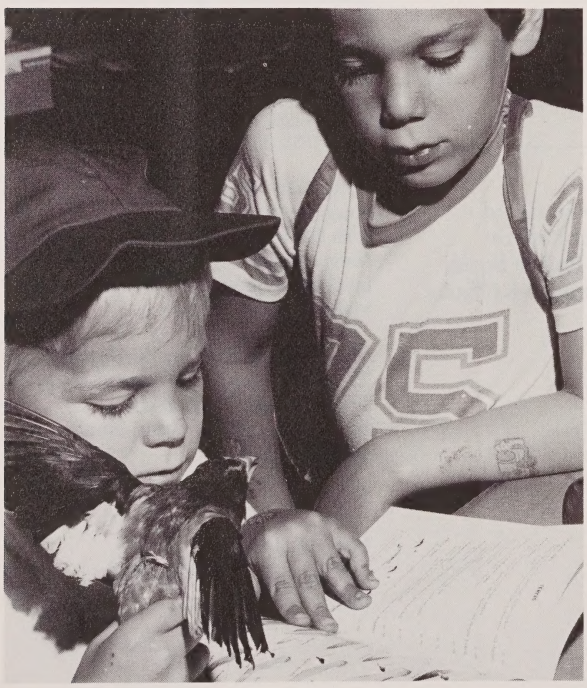
Mankind Discovering

Bette Shepherd

The ROM's new Discovery Room, opened this summer, is the first step in the Museum's planned expansion. It is, as well, an area designed to expand our traditional ideas of what museums do and the ways in which they can involve people.

Most visitors to the Museum will probably never have a chance to visit an archaeological dig, or watch a conservator repair and polish a fine old bronze, or research the development of pottery in Ontario. All these things, along with many others, are essential activities in a museum, but they are not easily demonstrated or described to the casual visitor. In the Discovery Room, the miracle of conservation has given artifacts new life to enable them to be studied at close hand. The visitor can put together and study pottery sherds from Ontario digs, or pick up and explore a variety of other objects which can only be seen behind glass elsewhere in the Museum.

The Discovery Room concept is fairly new to museums in North America, and the ROM's is the first in Canada. During nearly a year of preparation, it has involved almost all of the 19 curatorial departments in one way or another. The initial response from some curators was justifiably cautious. Concern was expressed about the display and use of artifacts and about whether or not the supervision would be adequate. Others wondered how their particular disciplines could possibly fit into the Discovery Room concept. The answer to all these questions is obviously "very well", and the involvement of the curators has led to the enthusiastic development of new ideas.



The design of the room, too, is crucial for its workability. The plan was worked and re-worked to provide as much natural and artificial lighting as possible, good traffic flow, and adequate seating and working space with a minimum of confusion for up to 25 visitors. One of the most innovative areas of the design is the darkened entrance to the Discovery Room. This incorporates a "touch wall", 28 squares of tactile material ranging from Persian "mail" to a cast of dinosaur skin, some fur and feathers, and a Braille description of the wall itself for those who cannot see. The Discovery Room is, in fact, a mini-museum for the blind. With so much to handle, and Braille labels to explain intricacies of design or function, the Museum is suddenly "seen" through new eyes.

In the Discovery Room, accessibility is the key to discovery. People have always brought their own fossils or artifacts to the Museum for identification. For this reason, identification units which enable the owner to help answer his own questions are a central part of the room. To "pin down" one of the first units created, donors had to be found for the more than 150 butterflies and moths found in Ontario, and once collected, the butterflies were professionally pinned in trays and labelled. Large collections of labelled fossils accompanied by diagrams and research material are also available. The locations of further study specimens in the galleries are listed, and a comfortable working area and equipment are provided. A wide range of magnifying glasses, microscopes, lamps, and special lighting helps to make the experience a pleasant one for the individual collector.

Not every visitor brings in material to identify, or comes for intensive study. Many are prompted by simple curiosity, and so "accidental discovery" plays a very

important role in the room. Strange tools invite the visitor to "use me"; a piece of bark with a delightful and familiar scent says "smell me"; a mineral is covered with iron filings that look like black fur; and a bat is unexpectedly discovered in a corner. Accidental learning or discovery can also be the result of solving a very simple wooden puzzle, made of animal-shaped pieces, or of turning over the label on an interesting object to find that it is the largest seed in the plant world. These objects create an atmosphere of interest and excitement, and for want of a better word, they are called "stumpers".

Other aspects of the Discovery Room are thematic and help a visitor trace an idea through many disciplines. A large oak tree, cut down this spring, from the ROM garden became the focus for a component dealing with Ontario woods, their identification, and their uses in the Museum. A glance in an Egyptian mirror found during a search through the Egyptian storage drawers suggested the idea for a component called "See Yourself Through the Ages". This display includes an obsidian mirror from South America, a Far Eastern black bronze mirror, and a polished bronze Japanese mirror that reflects the user's face and also the face of Buddha when sunlight is reflected from its surface to a wall. This component takes the visitor through the ages to the discovery of glass mirror surfaces in the 16th century, and finally shows that man has not always been able to see himself as easily as he can today. A skeleton, bones, and X-ray material encourage visitors to find other areas in the Museum where bones are studied to help find answers to archaeological problems.

Although live exhibits are restricted by maintenance and Public Health regulations, a terrarium and box tortoises could be included without difficulty. Not so "live" birds, but very lifelike birds are suspended from the ceiling, and a large and fierce-looking Horned Owl peers out from a corner. Visitors who are studying feather and nest materials find it helpful to be able to examine an owl's ear feathers at close hand.

Since there are no other museum Discovery Rooms in Canada, part of the preparation for the ROM's room involved a look at similar concepts in the United States. At both the Smithsonian in Washington, D.C., and the American Museum of Natural History, New York, the most concentrated activity and interest involved "boxes". The ROM's boxes are of brightly stained wood and contain a variety of museum material. They bear such intriguing names as "Match a Sound", "Hidden Colour", "Archaeology", and "Nature's Tools". Hidden Colour, for example, explores the hidden colour of shells, envelopes, and glass that is visible only under long-wave ultraviolet light. A pure white shell that has begun to fossilize is a lovely purple with pink spots under ultraviolet. Our everyday mail has hidden coding, and some ancient glass shows a very different colour when exposed to this special light. Magnifying glasses, microscopes, luxo-lamps and even a geiger-counter occasionally on loan from the Mineralogy Department all help the visitor experience the many facets of museum activities incorporated in each box, from conservation and documentation to archaeology and research.

The Discovery Room has taken unprecedented strides in another area with its international approach to language. Not only are all labels in French as well as English, but on some objects you may see Spanish, Portuguese, German, Italian, and Chinese.

Discovery Room activities are supervised by the Members' Committee and Museum Volunteers, who work morning and afternoon seven days a week. They offer enthusiastic help, give out box material, locate research books, set up equipment, maintain security, and frequently help visitors in languages other than English. Without their tremendous supportive help, the room could not possibly function with any degree of success.

The ROM's Discovery Room offers challenges to visitors of all ages. There are ideas for everyone, not just the hobbyist or the collector, that will engage all the senses and the imagination as well. The Discovery Room encourages children and adults alike to expand their thinking through all aspects of discovery.

We invite you to come and participate in your own and the ROM's expansion.

Bette Shepherd is a member of the Discovery Room Working Group, whose other members are: Mr. D. Newlands, Dr. G. Edmund, Dr. D. Barr, Miss J. Court, Dr. H. Fuchs, Miss N. Gahm, Dr. R.D. James, Mrs. M. Jones, Mr. R. Madeley, Mr. T. Moore, Mr. R. Moynes, Mr. J. Richardson, Miss N. Willson, and Mrs. J. Schroer.

The Neutral Indian Burial Site at Grimsby

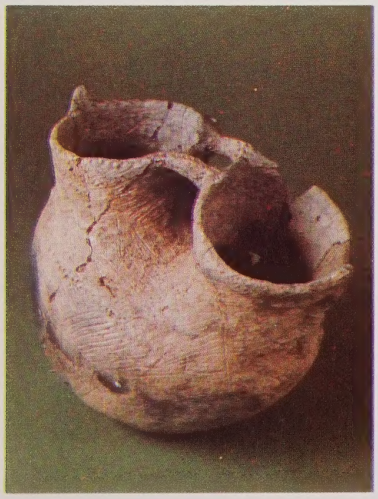
Some Bones of Contention

W.A. Kenyon

The town of Grimsby, Ontario is well known for the hospitality that it extends to visitors. This tradition, apparently, can be traced back to about 1625 A.D., the year that Étienne Brûlé visited there. Brûlé, so near as we know, was the first European to visit the area and to be entertained by the Neutral Indians who lived there at the time. Although the details of Brûlé's visit were never recorded, relationships must have been reasonably cordial, for shortly after his visit, one of the local damsels bore him a daughter. By the time she reached her early 20s the girl had attained some prominence in the community. She had become what a less strident age would have called a medicine man; and at her early death, when she was buried in the village cemetery just west of what is now Centennial Park in Grimsby, the tools of her profession were buried with her. Three of the sucking-tubes which she used in the curing ceremonies were carefully placed in the grave, just above her left shoulder.

A few years later, in 1650, the Neutrals were wiped out by the Iroquois of New York State. Many of them were slaughtered, while the remainder were dispersed, to be absorbed, finally, by neighbouring tribes. And so they were forgotten. There was no one left to remember their passing but a few historians and archaeologists, and the Iroquois people themselves. Their abandoned settlements were soon reduced to the humus from which they had sprung, while the slowly encroaching forest finally wiped out all traces of their villages, their corn fields, and their cemeteries. For over 300 years, the Neutrals lay shrouded in silence, while European settlers moved into their ancient homeland, to carve out farms and hamlets from what they believed to be the primeval forest. Traces of the old Neutral villages were turned up from time to time by the settler's plough, and on rare occasions human bones were also unearthed as the plough cut into one of the forgotten cemeteries.

It is perhaps a sad commentary on the human condition, but whenever one of the Neutral cemeteries was located, it was invariably looted by curio-hunters. I can find no instance in which a priest or minister suggested that the unearthed bones should be treated with the same dignity that would have been accorded to European remains. Nor can I find



Above: An unusual double-mouthed vessel from Grave No. 1. Note the salamanders at the rim.

Right: An assortment of beads and shells from a number of graves.

Left: Grave No. 62 was a mass burial containing 104 bodies.

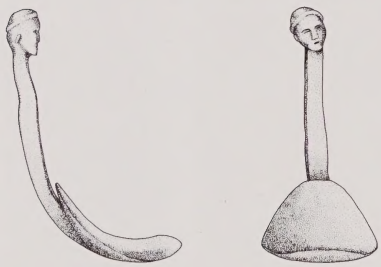
Photographs by Jim Chambers
Drawings by Nancy Tousley

any instance in which a constable or sheriff stopped the looting on the grounds that it is illegal to exhume human remains without proper authority.

Then in October, 1976, the Museum received a call from a Mr. Lawson Allez. He informed us that he had dug up an assortment of iron axes, copper kettles, and beads on the Robinson property, just west of Centennial Park in Grimsby, Ontario. He thought that he had been digging up the refuse from some pioneer farmstead till he unearthed a few broken bones and a complete human skull. At that point he stopped digging, carefully covered up the human remains, packed the rest of the objects in the back of his car, and phoned us for guidance.

When I visited the site with Mr. Allez on October 14, I realized that I was probably standing in one of the abandoned cemeteries of the Neutral, and one that was largely intact. Certainly the material he showed me could only have come from a cemetery, and it must have been traded into the area by the French, about A.D. 1650 or slightly earlier. This, then, could be a particularly significant discovery. Because we had arrived on the scene before the pot-hunters were able to rally their forces, we were in a position to protect an important and little known segment of the history of Ontario. We were fortunate, too, in that the Robinson family, the owners of the property, realized the importance of the discovery, and assured me that I could take whatever time was required to remove it. I decided, therefore, that I would not return to Toronto as planned, but would remain in Grimsby to protect the site. When I phoned the Museum to report what I had found, Dr. Tushingham, the Museum's Chief Archaeologist, agreed that I should start excavating immediately, and said that he would arrange for the necessary archaeological permit from the Ministry of Culture and Recreation.

The next few days were frantic. We established a grid system, and laid out an east-west and a north-south trench, each 8 feet wide, which intersected at the spot where Lawson had been digging. We then started excavating a few exploratory units in the disturbed area. While this was going on, we were visited by an endless stream of neighbours and school children, till some days we spent as much time talking as we did digging. We explained that we were investigating the old cemetery because, to us, the history of the Neutrals was just as important — and just as interesting — as the history of the Medes and the Persians. We explained, too, that the history of a people does not flow spontaneously out of that people and into a history book. On the contrary, it is



Above: This wooden spoon was found inside a copper kettle, which preserved it from deterioration.

Right: This skull with a clay pipe beside it was found in Grave No. 1.

Opposite page: The work at the Grimsby site was slow, painstaking — and frequently a cold business.

a slow, meticulous business to root through the records of past ages, to sift out and evaluate significant clues, and finally, to assemble them into a meaningful narrative. The process is complicated, too, by the fact that so very few people left any written records. Far less than one per cent of human history is recorded in any form of writing. For most people, the only signs of their passing are the bits and pieces of physical evidence that are scattered about their villages, their camp sites, and their cemeteries. And therefore, if we are to know these people, we must dig them up. There is simply no other way.

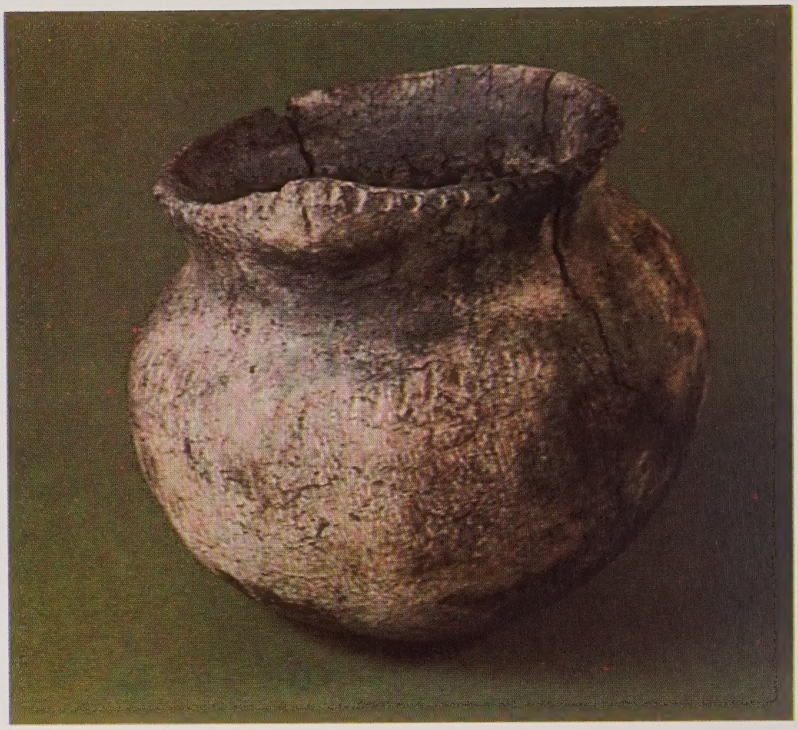
Because we knew so little about the Neutrals, we were not sure what we were getting into. We decided, therefore, to run a shallow trench, just into the upper surface of the sub-soil, to the east of the disturbed area. As soon as this was done, we encountered a number of dark, circular stains which presumably marked the location of graves. Choosing one of these at random, we started excavating, and at a depth of 3½ feet we encountered human bones. As we carefully exposed them, it became evident that we were at the southwest corner of a large, multiple burial. And almost immediately we unearthed a double-mouthed clay pot, a magnificent specimen decorated with small lizards or salamanders that were scampering about its rim. Beside it was a fine copper kettle, 9½ inches in diameter and 4½ inches high. The outside of the kettle was blackened with the soot of ancient campfires, indicating that the specimen had seen long and strenuous service before it was placed in the grave. Just to the east of the kettle, and carefully wrapped in beaver skin, was an antler comb surmounted by an otter which was cautiously peering over his shoulder. Scattered throughout the grave were 126 glass and shell beads, two clasp knives, five tobacco pipes, and a number of small items of copper or brass that have not yet been identified.

The grave contained the bodies of 17 people — five adult males, five adult females, and seven children ranging in age from 2½ to 15 years. I thought at first that the grave contained a series of bundle burials. That is, I thought that each of the individuals that was buried in the pit had been buried previously, and that their bones had then been dug up, gathered into a bundle, and finally reburied. Many of the bones, however, were in their correct anatomical position, which suggests that they were primary burials. While we were still working on Grave No. 1, we opened Nos. 2 and 3, just a few feet to the east. Grave No. 2 contained a single burial, a male aged 25 to 30. He was lying on his right side, with his knees drawn up to a nice comfortable angle. When he was buried, he was wearing a large conch shell gorget on his chest, and clusters of small copper beads at each knee. In all probability, then, he was wearing beaded garters or leggings when he was interred. By his right elbow, there was a lump of bright red ochre. Grave No. 3 also contained a single burial, a female of something over 40 years of age. She, too, was comfort-

Right: This typical Neutral clay vessel was found in Grave No. 3.

Below: An intact double-mouthed vessel.

Bottom: Three star beads of Venetian glass. The one at the right has had the blue and white layers removed to show the red, a colour with rich symbolic associations for the Neutral.



Antler comb surmounted by an otter.

ably flexed, and lying on her right side. At her head were two fine clay vessels, each containing a handful of bird or animal bones. These were the remains of a soup or stew that had been placed in the grave for the nourishment of the departing spirit. Between the pots were some small pieces of flint and a few beaver incisors. At her feet was an iron axe, and near her chest was a whetstone.

At this point, while we were still trying to sort out the burial patterns of the Neutrals, I was placed under citizen's arrest by the Union of Ontario Indians for failing to comply with the provisions of the Cemeteries Act, and for offering an indignity to human remains. I closed the site at 5:15 that night, November 2, 1976. The site remained closed for the next two months while legal, moral, and political issues were debated. Charges and counter-charges were hurled about with reckless abandon. Politicians tightened up their ranks, and retreated in close formation behind the ramparts of bureaucratic silence. Moral rights were confused with legal rights; firm stands were taken; heroic postures were assumed; generals announced with reluctant glee that they might not be able to control the troops; and ultimatums and theses were nailed to the windmills of rhetoric. But nothing happened. It was immediately apparent that Ontario lacks both the legal and the social machinery that should be available for dealing with such matters.

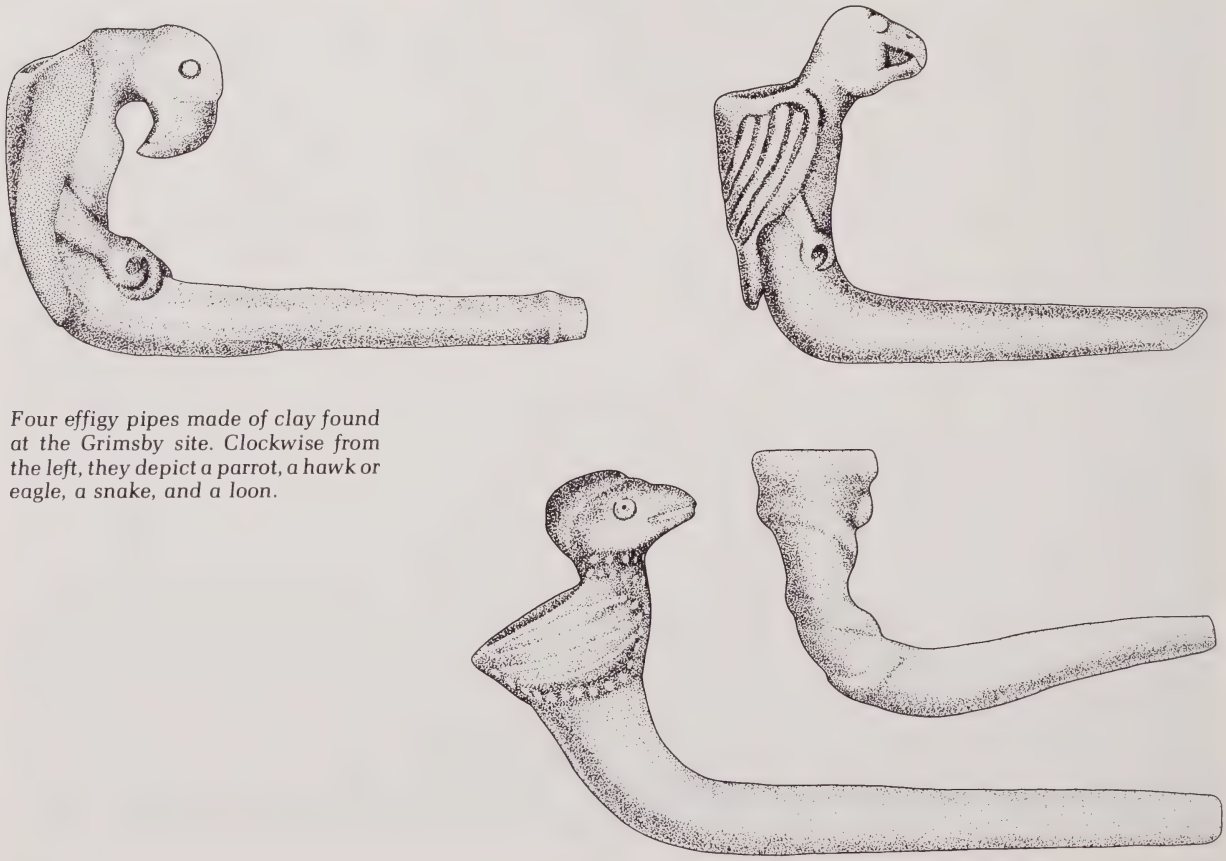
It was admittedly a complex situation, but it was certainly not unique. Ontario, like the rest of Canada, is thickly dotted with unmarked graves and cemeteries. After all, there have been people living in this country for well over 20,000 years. Because the location of these prehistoric graves and burial grounds has long since vanished into the mists of antiquity, there is really no way of protecting them apart from making it illegal for people to dig holes, and for rivers to erode their banks. So long as people are permitted to build

houses, apartments, roads and canals — and so long as rivers are permitted to erode their banks each spring — human remains will continue to be unearthed, just as they were in Grimsby. And the next time they are unearthed, as they inevitably will be, the same problems will arise unless some reasonable policy decisions are laid down in advance.

While a blind justice groped along what it fervently hoped were the paths of righteousness, I waited in Grimsby for a decision. Guards were posted at the site to maintain a round-the-clock surveillance, for the threat of vandalism was always present. Several times each week I thanked the Robinson family for their patience and understanding, and assured them that they would indeed be able to proceed with their housing development. My own legal position had been questioned, and might be questioned again, but theirs was impeccable. They owned the property, had cleared their projected housing development through the various municipal and provincial authorities, and wanted the cemetery removed from their property. Although they wanted it removed as rapidly as possible, they also wanted to make sure that the history of the Neutrals would be carefully recorded and preserved, and that the move itself would comply with all the regulations that govern the moving of cemeteries. And I assured them, even in the heat of battle, that this would be done.

As fall moved slowly into winter, we guarded the site, tried to keep warm, and assured each other that we would eventually get back to work. On many occasions, our voices may have lacked conviction, but there was never any serious doubt as to the outcome. With the approach of Christmas we decorated the trailer which served as our field office as well as the bunk-house for the night watchman. A Christmas tree was put up on the dirt pile, close to the flag pole where the ROM pennant was still proudly flying. Tastefully decorated, its coloured lights blinked out their eternal message of hope and human warmth. That night, I made an entry in the account book: 1 Xmas tree and lights, $16.35. As I closed the book, I breathed up the silent wish that some of the festive spirit might still be present when our chief accountant read of that improbable item on my expense account.

After a brief holiday, we returned to Grimsby on January 2. The site itself looked cold and unfriendly. The snow-fence which surrounded the operation was still standing, though the guard reported that he had had to repair it every few days. Huge drifts of snow covered much of the site, and were even found inside the tent which covered the graves we were



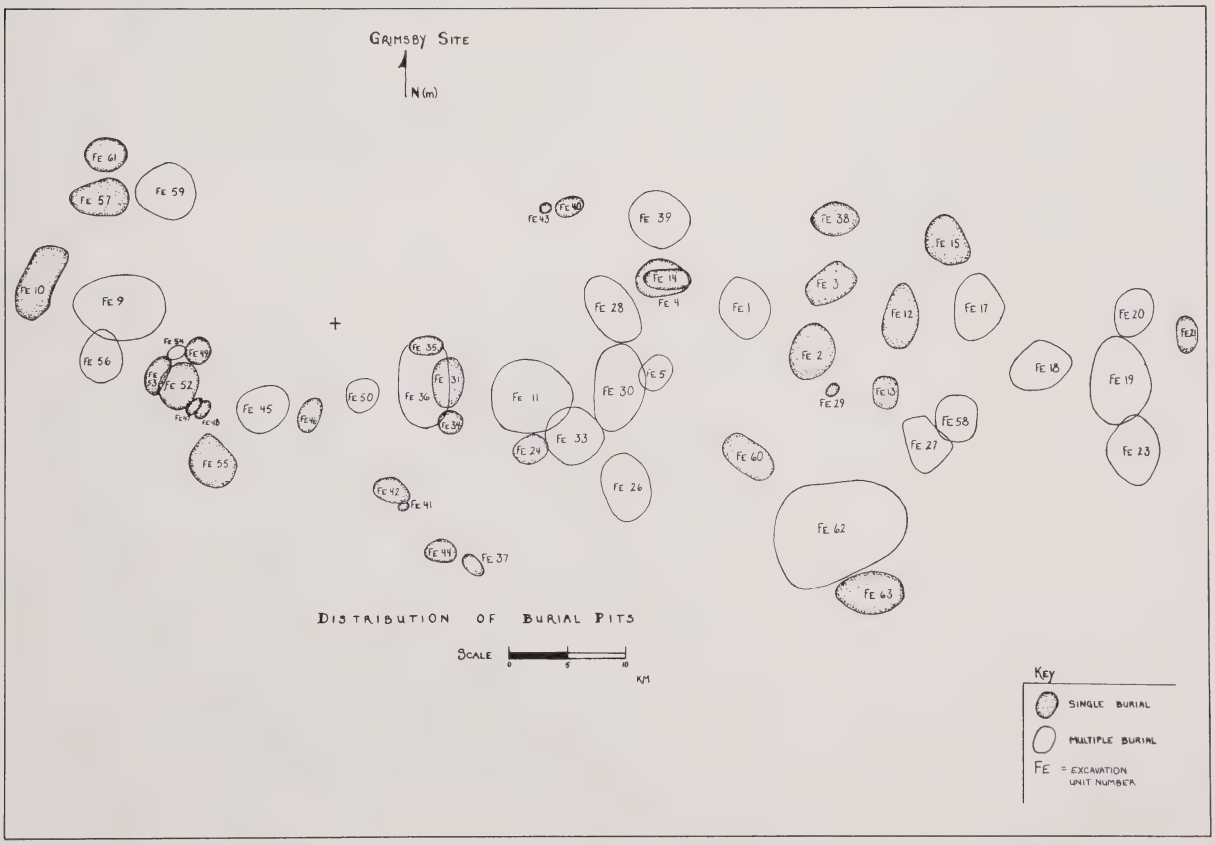
Four effigy pipes made of clay found at the Grimsby site. Clockwise from the left, they depict a parrot, a hawk or eagle, a snake, and a loon.

working on when we closed the excavation. The tent itself was still standing, although the side-walls were ripped in several places, and the entire structure was leaning over at a rather precarious angle. As the political and legal problems had been solved, more or less, over the holiday season, I started back to work.

I had never tried a winter excavation in Ontario before, and to my knowledge neither had anyone else. As a result, we had to work out our own procedures. First we attacked the frozen earth with a pick axe, and learned that the ground was frozen to a depth of almost two feet. With that bit of knowledge filed carefully away, we placed reflecting propane heaters around the edges of the burials that were being worked on when we closed the dig. Although this worked reasonably well, it was a slow, cold method of thawing them out. The problem was not generating heat, for we had a wide range of propane heaters. But we could not figure out a way of persuading that heat to thaw out the frozen ground.

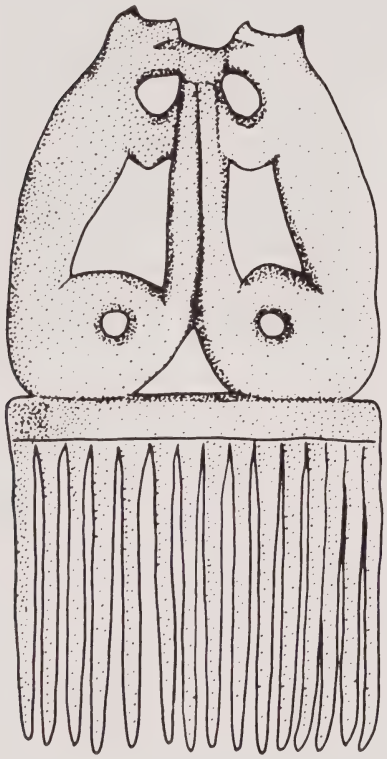
We finally solved the problem to our satisfaction by the construction of what we called "igloos". These were small, rectangular structures, eight feet square and four feet high, with plywood roofs and plastic sides. A single propane heater left burning in one of the "igloos" for 24 to 36 hours would usually thaw out the ground. Generally, we built our igloos inside the large 30 × 50 foot tent which we kept over our working area, and when a section was thawed out we would simply remove the igloos, and work without further shelter. Occasionally, however, we would erect one that we could stand up in if we needed to work in an area outside the tent.

By late January, we had the operation running quite smoothly, considering the physical conditions under which we were working. My associate field director, Kathy Mills, had moulded the crew into a smoothly working team which thawed out the ground, unit by unit, located the graves, exposed the skeletal material for mapping and photography, and then removed it to the laboratory for analysis. Mapping the graves was the most difficult and time-consuming part of the operation, particularly those graves which contained the bodies of several different individuals. When we finally sorted out the burial practices, mapping became less difficult, because we could proceed with greater assurance. For we had learned that the single and multiple burials, by and large, represented summer and winter deaths. That is, an individual who died in the summer would be buried in a single grave. When we encountered such a grave, we would find the skeleton either



flexed or extended, but with each bone in its correct anatomical position. Most of them were also provided with grave furniture which was to accompany their spirits into the orbits of eternity. Those individuals who died during the winter, however, were kept in the houses until the ground thawed out in the spring. They were then buried either in a common grave, or, more likely, in family graves. In any event, the bodies that were kept in the cabin all winter would be at least partially decomposed by spring, and this would account for the many semi-articulated skeletons that were found in the multiple burials.

By the time we had sorted out the burial practices of the Neutral, we had seen and handled a wide range of skeletal materials, and had formed some clear impressions of the people themselves. It was a youthful population, made up of tall, healthy, vigorous and well-nourished individuals. In their own terms, they were incredibly wealthy, and they poured that wealth into the graves of their dead with a lavish hand. For example, Grave No. 9 contained the bodies of 57 individuals — 26 adults and 31 sub-adults. One of the adult females, incidentally, was the



Above: Bear effigy comb carved from antler.

Right: Two vessels from the Grimsby site.

medicine woman mentioned above, whom we suspect might be the daughter of Étienne Brûlé. All that we really know, of course, is that the timing is right, and that she is half European. For the gross morphology of her skull — that is, its general appearance — is distinctly European, while her dentition, with equal assurance, is Indian. Grave furniture for No. 9 consisted of seven sucking-tubes, four turtle shell rattles, four clay vessels, one antler comb, two lumps of red ochre, some animal bones which probably had some ritual significance, 20 copper beads, 274 shell beads and 421 glass beads.

We completed the excavation at 5:15 p.m., on April 4, 1977, almost six months after we started. During that period, we removed 374 bodies from 55 graves. To record the location of the bones and grave furniture within the 55 graves, we drew 110 maps, and have already made 627 entries in the field catalogue. Totals are not yet available, but some of the major categories of grave goods include: 35 ceramic vessels, 28 stone and ceramic pipes, 16 copper kettles, 14 iron axes, 43 flint arrow points, and well over 14,000 shell, stone, and glass beads.

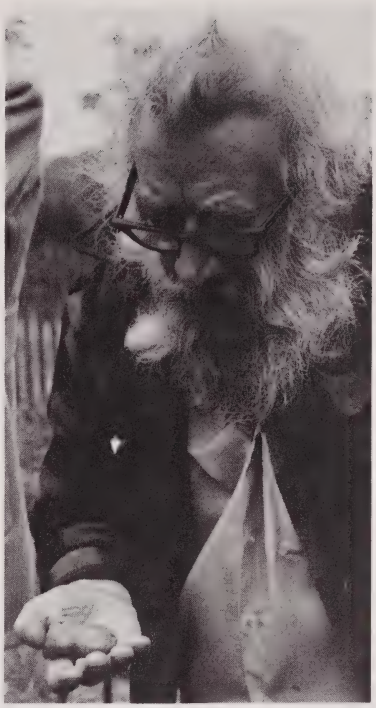
This is admittedly an impressive collection of specimens, and it will be invaluable in illustrating the way of life of a people who are long since gone. But even more impressive, in my opinion, are some of the subtle clues that are scattered throughout the body of data. For example, one of the most spectacular items that the Neutrals were getting from the French was the large star bead such as the ones illustrated on page 8. These were built up of six successive layers of different coloured glass, and then the ends were bevelled to bring out the characteristic patterning that gave them their name. The outer layer was a deep, royal blue. Beneath this was a thin, white layer, and beneath that again was a thicker layer of brick-red glass. To us, with our European background, the blue outer layer conjures up visions of empire, and the pomp and circumstances of royalty. The Neutral Indian, on the other hand, was equally steeped in tradition, but the symbolism was different because it related to his own past and to his own system of values. In his experience, the "royal" colour, so to speak, was a brick red. He valued red ochre as the ancient symbol of life, and almost certainly placed an equally high symbolic value on Catlinite, a brick-red stone that was quarried in what is now western Minnesota. The Indian certainly appreciated the large star beads, for they are very striking objects. But he did not like the fact that the highly valued brick-red layer was obscured by a thin layer of blue glass which he felt was in rather poor taste. So he sat down with a slab of sandstone and carefully ground off the offending outer layer. He was quite prepared — even anxious — to accept European items in trade. But he would modify them till they could be fitted more or less comfortably into his own system of values, a vision of the full and dignified life that had not yet been seriously distorted by alien forces.

The excavation of the Neutral cemetery in Grimsby was one of the most difficult exercises in political archaeology that I have ever been involved with. But in spite of all the noise, confusion, and silliness that obscured the basic issues, it was also one of the most rewarding. Prominent among such rewards was the following letter:

Dear Dr. Kenyon
Will you tell me how you got to be an archaeologist because I want to be one too.

Yours truly

John Davis
Grade 1
St. Denis School
Carlton Street
St. Catharines, Ontario



Walter A. Kenyon, with the Royal Ontario Museum since 1956, is Curator of Canadian Archaeology in the Office of the Chief Archaeologist. Although research has led him from the central and eastern Arctic to the West Indies and Central America, most of his work has been devoted to the pre-history and early history of Ontario. For the past few years, he has also been doing underwater archaeology on the old canoe routes of the fur traders. He is the author of two books on northern exploration, The Strange and Dangerous Voyage of Capt. James, *and* Tokens of Possession.

The Timeless Elegance of Lalique Glass

A Look at the Glass and its Maker

C. Peter Kaellgren

Photographs by Bill Robertson

René Lalique ranks as one of the most important designers of glass in the 20th century. The recent products of his factory can be seen in many of the best gift shops and have been enjoyed by Canadians since the 1920s. His jewellery and early glass are collected by museums and private collectors as fine examples of modern style and workmanship.

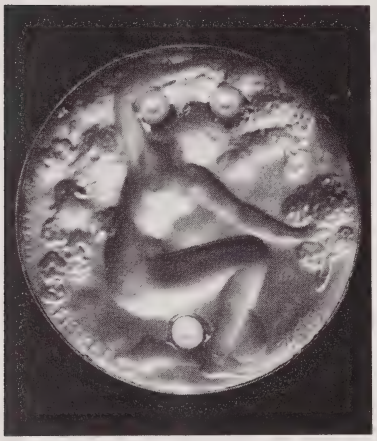
René Jules Lalique was born on June 4, 1860 at Hay, Marne, in the Champagne District of France. His training included the study of drawing at Turgot College followed by the Ecole des Arts Decoratifs in Paris. While at the Ecole, he was apprenticed to the important Parisian jeweller Louis Aucoc. For two years, 1878-1880, he studied in England. At this time Britain was an important design centre where some of the earliest art nouveau tendencies appeared under the influence of the Aesthetic Movement, championed by William Morris and other intellectuals. This was an era in which fine hand craftsmanship and individual designs were enjoying a renaissance. When Lalique returned to France, he worked in this manner as a free-lance designer for such Parisian jewellers as Aucoc, Cartier, and Hamelin, drew designs for fans, wallpapers, and textiles, and briefly collaborated in furnishing jewellery drawings for the journal *Le Bijou*. Lalique also studied with the artist Lequien, the son of his former teacher at Turgot College. All of this and his subsequent experience were later to be incorporated in his glass: in its carefully thought out design, in the persistent attention of a jeweller to the detail and finishing of the best pieces, and in the rhythmic integration of sculptural decoration with the conception of the whole object.

Lalique glass from two eras. Opposite page: A covered box of moulded lead glass, 1922-32. This model was named "Dinard". This page: Wine glass of clear lead glass made in the 1950s. This "sourire de Rheims" model, with a smiling angel moulded and frosted with wheel-engraved wings, is typical of post-World War II Lalique products. Gift of Mr. Dean S.M. Field.

Lalique pursued a variety of business associations until 1885, when he set up his own atelier. During these years his work became increasingly renowned. He exhibited jewellery of his own design and workmanship for the first time in the Paris Exposition Universelle of 1889. In 1890, he moved operations to larger premises at 20, rue Thérèse at the corner of Avenue de l'Opéra, where he installed a complete glass workshop. Here he produced vases, flaçons (bottles), various dressing-table accoutrements, objects of vertu, and components for such objects. The glass was both worked in a molten state and melted in moulds in a powdered form (pâte de verre). He also made extensive use of enamelling, which involves the melting of a glassy substance. Both the champlêvé (enamelled on the surface of the metal) and the plique-à-jour techniques (enamelled within tiny metal enclosures without backing, much like stained glass windows) can be found in his work. In the 1890s, the wider range of materials employed by art nouveau designers to interpret forms derived from nature enhanced Lalique's creations. Along with more traditional jewellery materials, he utilized ivory, baroque pearls, horn, tortoise-shell, mother of pearl, opals, various semi-precious stones, and glass. Excellence of colour, design, and workmanship were of the utmost importance to him, and he did not hesitate to use aluminum, brass, copper, and even iron when they were more appropriate than precious metals.

Much could be written about the beauty of the early Lalique jewellery, which is found only in a few fortunate museums such as the Walters Art Gallery in Baltimore and the Gulbenkian Foundation in Lisbon, Portugal. This jewellery is very rare, and shows how art nouveau was pushed to its ultimate conclusion. As a reviewer in *The Studio* (1905) implied, such exquisite craftsmanship was all very well, but what really was the use of making a hat pin that perfectly simulated an orchid?

Lalique's jewellery can be seen as a highly successful exploration of materials, themes from nature, and classic styles from the past. Lalique jewellery in the ROM includes two pieces of later commer-



Above: Brooch in cast pale lilac glass set with three simulated pearls, probably made 1922-25.

Right: Vase of moulded opalescent glass, 1922-30. Like many Lalique designs, this was named; it was called "Bacchantes".

Left: Perfume bottle of colourless non-lead glass, purchased in Paris in 1926. Gift of Mrs. Hazel C. Mathews.

Right: A bowl of opalescent lead glass, made in the 1930s, shows a more geometric treatment of the shell motif. Gift of Miss Helen Sutherland.

cial quality. One is a pin mounted in sterling silver, the other is a long "flapper" necklace of a pattern popular in the 1920s. Almost all of the Lalique jewellery available to collectors is of quality similar to these. Many of the plaques, however, appear to have been mounted by manufacturers of costume jewellery, as the settings and the added paste stones do not reflect the refined taste of the Lalique factory.

All the qualities that characterized Lalique's jewellery are also evident in his glass. After 1900 Lalique became increasingly drawn to glass — perhaps because he was fascinated by the possibilities of a new medium, perhaps by the opportunity to reach a wider, more popular market with his sensitive designs. Around 1902, he took over a small glassworks at Clairfontaine in the forest near Ramboullet. He set up a small kiln and with the help of four workers made experimental statuettes, unique glass vases, and plaques for mounting in doors, chandeliers, etc. Many of these were made by the *cire perdue* process, which is usually reserved for metal casting. For moulding glass, the Lalique model was sculpted in wax and given a heavy coating of clay; the wax was then melted out and the mould filled with molten glass. In 1905, Lalique opened a new shop at Place Vendôme No. 24 for the sale of his glass artifacts.

About 1907-08, François Coty invited Lalique to design bottles for his perfumes. This was the first step toward the production of glass on a larger commercial scale. Other commissions followed. Katharine Morrison McClinton, a recent writer on Lalique glass, estimates that from 1910 to 1920 between 250 and 500 million perfume bottles were produced in Lalique designs. Certainly fancy perfume bottles had been known earlier, but they were made as part of dresser sets and not as the actual packaging in which the perfume was sold. The comment of the reviewer in *The Studio* seems to apply equally well to Lalique's jewellery and to his perfume bottles: "M. Lalique is courageously Parisian in the way he gives his great imaginative skill to the splendours of fashion."

In 1909, Lalique opened a new glassworks at Combs, named Verrerie de Combs-la-Ville, and further expanded his lines to include lamps. In 1912, he had the first major exhibit of his new lines and ceased making metal jewellery altogether. His operations seem to have been interrupted during World War I, but after the war he constructed a large new glassworks at Wingen-sur-Moder in the Bas-Rhin that was completed in 1922. This was named Verrerie d'Alsace René Lalique & Cie. By the time Lalique exhibited in the Exposition International des Arts Décoratifs et Industriels Modernes in 1925, he was the most important manufacturer of quality, mass-produced glass in France. His work for the Exposition included lighting fixtures, decorative panels, and fountains. The range of his products had now expanded to tableware, desk and dresser equipment, statuettes, boudoir clocks, and by the late 1920s, ornamental radiator finials for cars, some of them with special lighting concealed in their bases. His glass was produced in mat and glossy finishes and in colours, with opalescent white being the most popular. One of his most important commissions came in 1932, when he was asked to decorate the main dining salon of the luxury liner *Normandie*. By this time, too, Lalique glass was widely sold in England and North America.

The factory at Combs-la-Ville was closed in 1937, and the production of glass at Wingen-sur-

Moder ceased during World War II. In 1945 René Lalique died. Although the Verrerie d'Alsace had been damaged during the war, many of the moulds destroyed, and the craftsmen dispersed, the firm recommenced operations and is still making glass today.

Many of Lalique's models for glass reflect the ideas of art nouveau, a style he helped to originate. The influence of this style can be seen in the human and animal figures, the natural plant motifs, and the marine motifs, often with sinuous lines and asymmetrically balanced elements. Lalique's art nouveau beginnings were also reflected in the names he gave his designs. For example, one of his models was named "Vallauris", possibly in tribute to Clément Massier, a famous French studio potter of the art nouveau period who worked at Vallauris.

Only towards the 1930s did Lalique begin to adopt the purely geometric and abstract motifs characteristic of what we call today "art deco". The new interest in black culture also left its mark on much French design of the 20s and 30s, though it did not influence Lalique's work, perhaps because his art training was firmly rooted in the classical tradition. Nevertheless, he did produce a number of pieces with naturalistically modelled African animals and sometimes used a dark colour of glass reminiscent of ebony.

Imitation is the truest compliment that can be paid to a designer. With Lalique glass, imitation was the rule rather than the exception. By and large, most of the imitations do not have the impact of the originals. They are often "cuter" and seldom as well finished. Most of the Lalique pieces were made of quality glass with a high lead content, and the moulded designs were often given a "patination" of pigment to enhance the details. (This pigment should be treated by any owner with care, as it is soluble in many cleaning agents!)

Perhaps the most successful of the imitators was the glassmaker Sabino, who signed his products with his name engraved in script. These are of a cloudy glass with a yellowish opalescence. Sabino glass has been in production since the 1930s and is still being made in many of the original models, notably small animal figurines. Other imitations of the Lalique style were also made by Etling and Barolac.

Above: One of many imitation Lalique pieces, this vase was made by the Verlys division of the Holophane Glass Co. of Ohio in the 1930s.

Right: The "Penthievre" vase from the Lalique factory is of dark amber-coloured, mould-blown glass. It was a wedding present to the donor, Mrs. Edgar J. Stone, in 1929.

Pieces signed Verlys in script were made in both France and the United States between about 1930 and 1950. These are usually of clear or smoky coloured glass with a frosted finish. The sculptural decoration of Verlys glass tends to overwhelm the forms, which are not as graceful as those of Lalique. Certain unmarked frosted pieces were probably made in Czechoslovakia. In America, the Phoenix Glass Company of Beaver County, Pennsylvania, was a source of mass-produced, commercial imitations. Its most obvious copy was a pattern of grasshoppers poised on blades of grass. The Phoenix glass designs are more poorly modelled than those of Lalique and often have a heavy surface patination which was apparently fired on in a kiln.

The ROM collection contains 15 pieces of Lalique glass, including two pieces of jewellery, two wine glasses, three perfume flaçons, one covered box, one bowl, and six vases. Of these, 13 probably date between 1922 and 1937/39, the important period of commercial production. Even though certain pieces like the "Bacchantes" vase are still being made, the quality of such an early example is much superior and much closer to the original design.

Like much of the ROM's collection of the decorative arts, all of the Lalique pieces have been acquired as gifts. The first two were included in a group of contemporary glass presented by Josephine Burnside in 1941. The ROM's Lalique collection exemplifies two principles of museum collecting: connoisseurship and documentation. All of the pieces have been acquired because they are the best examples of the decorative designs and techniques of the period. Some are major display pieces; others are suitable for occasional display and for study.

The full range of commercial Lalique glass, from mass-produced models in non-lead formula to high-quality art pieces, is represented in our collection. Five variations of the Lalique signature are found among the pieces. To date, no writer has been able to explain the dating of Lalique glass by the markings in a completely satisfactory way. It can only be said with certainty that examples marked "R. Lalique" pre-date 1945; the "R" initial was dropped after his death. Pre-1939 pieces of superior quality are often found with "R. LALIQUE" cut in block capitals along with the model number on the bottom.

Certain of the ROM's pieces have an added importance because family traditions suggest that they were used in Canada. This and other evidence of the taste of earlier generations of Canadians is invaluable in restoring historic sites with appropriate artifacts.

Naturally, the ideal of any museum collection is to have enough pieces to adequately represent the style of a period or artist. An art nouveau specimen of Lalique jewellery would be a highly desirable acquisition; but such pieces come on the market only rarely and at prohibitive prices. An early electric fixture or lamp, examples of some of the perfume bottles, and early pieces showing various decorative techniques such as engraving or enamelling would be more attainable and equally useful additions to the collection.

Lalique glass is occasionally brought to the Museum for identification. Recently, one visitor brought in a brooch mounted with a glass seal signed R. Lalique and datable to between 1922 and 1939. The visitor had written to the New York offices of the Lalique firm seeking further information; they had replied that they could give her no help, since they only make "reproductions" of certain early designs. This statement sums up the present-day products of the Lalique factory, which are almost all colourless glass with a glossy or frosted surface. Even though the detail of the moulding is not as good as on many of the old models, the timeless elegance of the designs is still appreciated today as much as when they were introduced.

C. Peter Kaellgren joined the ROM's European Department in 1972. His area of interest is post-1700 Western decorative arts. In the past year, much of his time has been devoted to preparing for the exhibition "A Gather of Glass", which opens on October 6. This special exhibition traces man's use of glass from earliest times to the present, as shown by the ROM collections. "A Gather of Glass" will be supplemented with tours by the Members' Committee, a special Sunday programme of films, a lecture series on glass-related topics, and a seminar on glass in Canada sponsored by the Ontario Museum Association.

Right: Although only about a foot long, these hatchling black caimans are quick to defend themselves.

Below: The adult spectacled caiman grows to over six feet in length, but can be immobilized with the aid of stout rubber bands. At the other end of the rope is an investigator preparing to release this specimen.

Rubber Bands Disarm These Touchy Reptiles

To Catch a Caiman

Jim Lovisek

Photographs by the author

For most people, Amazonia conjures up images of primeval jungle swamps writhing with the twisting scaly bodies of man-eating alligators. Early Amazonian naturalists helped perpetuate this image in their colourful narratives. Henry Walter Bates, renowned for 11 years of exploration and prolific collecting in the mid-19th century, described the upper Amazon during low water:

"It is scarcely exaggerating to say that the waters of the Solimoes are as well stocked with large alligators in the dry season as a ditch in England is with tadpoles. During a journey of five days, which I once made in the upper Amazons steamer in November, alligators were seen along the coast almost every step of the way, and passengers amused themselves from morning till night by firing at them with rifle and ball. They were very numerous in the still bays, where the huddled crowds jostled together, to the great rattling of their coats of mail, as the steamer passed." (*The Naturalist on the River Amazons*, p. 311.)

That image persists to this day, even though the populations of "alligators" (actually caimans, a close relative) have been greatly depleted. Ruthlessly overhunted for belly skins, and pushed into remote areas by habitat destruction and encroaching civilization, most South American crocodilians have reached the precarious stage of threatened or endangered species. One painful aspect of the tragedy is that little information was recorded about these unique reptiles during times of plenty, and today, dwindling populations usually prohibit any intensive life history study.

Caiman hunters are rapidly destroying a valuable resource for short-term financial gain. Belly hides of the spectacled caiman are salted and sold to itinerant traders for a meagre portion of their true value. (Photo by Roger Foote)

There is commonly a good deal of confusion about the nomenclature of the crocodilians, a term that refers to the true crocodiles, the alligators, the caimans, and also the gavials. The caimans are not alligators, though they belong to the same family, the Alligatoridae. The only two species of true alligator are the American alligator restricted to the southern U.S.A. (*Alligator mississippiensis*), and the Chinese alligator (*Alligator sinensis*). No true alligators or crocodiles are endemic to the Amazon basin watershed.

The four caiman species of Amazonia vary in appearance, size, habits, and commercial importance. The dwarf and smooth-fronted caimans (*Paleosuchus palpebrosus* and *P. trigonatus*) are smallish, and grow to an average adult size of three to four feet. They are often found in smaller, fast-flowing streams. Because of their heavy armour, only a thin strip of the hide along the sides can be utilized by tanneries, and consequently these species have not yet been exploited to any large degree for commercial purposes.

The spectacled caiman (*Caiman crocodilus*), named for its bony preorbital ridge, occurs from Mexico to Paraguay. In the 1960s hundreds of thousands were imported to North America and sold by pet shops as alligator substitutes. Few probably survived to their adult size of six and a half feet.

The black caiman (*Melanosuchus niger*), largest of the South American alligatorids, is truly a monster. Its 16-foot bulk is armed with biting jaws and lashing tail. This is the beast which lurked around bathing holes in Bates's time, waiting for the unsuspecting chicken, dog, or hapless person.

Funded with a small grant from England's Fauna Preservation Society, I flew to Bolivia in the fall of last year to undertake field studies of the nesting biology of the spectacled caiman, *Caiman crocodilus yacare*. Dr. Frederico Medem, director of the Instituto Roberto Franco in Villavicencio, Colombia, and one of the world's leading

crocodilian experts, had told me that Bolivia might be a fruitful study area. According to Dr. Medem, it was one of the few areas left in South America where natural, undisturbed populations of "crocs" were to be found.

The spectacled caiman has never been exploited for commercial use until recently, thanks to the dermal bones (ostederms) that lie underneath its hide. In the last few years a process has been developed for "smoothing" these "buttons" by shaving to give the hide greater flexibility, but even so only two thin strips along the sides of the animal can be used. The hide of the giant black caiman, on the other hand, is prized by tanners, and I had few hopes of encountering this impressive saurian. The black caiman is now extremely rare in most parts of its range, and it is believed that its survival is so tenuous that detailed life history or ecological studies are probably impossible.

When I arrived in Trinidad, Bolivia, I rented a single-engine Cessna airplane to take me to San Marcos, an *estancia* on the Isiboro River an hour's flight to the southwest. After a minor problem of locating a reputable pilot we were soon airborne, the frustrations and headaches of a myriad final preparations dissipating as the plane soared over an undulating sea of green savanna broken by incredibly contorted lazy rivers and islands of forest. When we landed at the primitive dirt airstrip the ranch owner I had contacted over the public radio daily message service was awaiting my arrival with horses ready to carry me and my valuable equipment to his *estancia*, several sun-scorched hours distant.

The following evening my dugout canoe silently sliced through the tranquil waters of Laguna San Marcos, a nearby oxbow lake. My powerful headlight illuminating the shoreline was reflected in hundreds of fiery glowing eyes. "Lagartos", mumbled my Indian assistant — the word used in Bolivia and Peru for the spectacled caiman.

It is difficult to express the extreme satisfaction and enjoyment I derive from "working" in isolated, unpeopled areas. The euphoria of canoeing in a night pulsing with jungle sounds, and bathed in calming starlight, overrides any discomforts that clouds of biting insects or aching feet might bring.

One of my nightly routines was to capture live caiman of all sizes for a marking programme to investigate natural growth rates and short-term movements. I was also interested in documenting variation in head and body measurements and scalation patterns in different geographic areas, information that might be useful in a future management programme. In Australia, scientists have used this kind of information to pinpoint with 90 per cent accuracy the origin of freshwater crocodile hides, knowledge that helps prevent illegal exploitation.

I had gained some experience noosing alligators from flat-bottomed "john" boats in Louisiana's Rockefeller Wildlife Refuge, but catching caimans in a wobbly dugout canoe that rode only inches above the waterline proved to be extremely interesting. The equipment needed to capture caimans is relatively simple: a wire locking snare attached to a rope, one pole, several sacks, and lots of heavy-duty rubber bands. Smaller caiman up to 30 inches in length can simply be grabbed by the neck and thrown into a sack, but their larger relatives need a little more care.

After a few nights' experience, I learned to estimate the size of a caiman to within a few inches by the head size, or by the separation of the reflected eyes. If the caimans have not been previously disturbed by lights (they quickly learn to duck under the water), and if it is a dark night (a full moon is cursed by caiman hunters and caiman scientists alike), the reptiles can usually be approached without difficulty. The wire noose is slipped over the head, the pole jerked to tighten and lock the snare, and with luck you've caught yourself 120 or more pounds of angry, fighting caiman. The water foams and boils as the caiman lashes and snaps at its unseen foe, rolling and twisting over and over. But in an amazingly short time the beast is exhausted and can be paddled to shore behind the boat. It is then hauled up on dry land, and a sack is thrown over the head. Next, someone, and for some strange reason it usually turns out to be me, jumps on the caiman's back, simultaneously grabbing the jaws. Two or three rubber bands are sufficient to immobilize the jaws. If the caiman is large, the hind legs are trussed over the tail for transport back to the working site. Then the head and as much of the body as possible are shoved into a sack. By now the caiman realizes its defeat and lies passively in the boat.

Once as I was paddling the dugout to shore with my catch, a six-foot-long pregnant female, she erupted from the water like an angry guardian spirit of the lagoon, grabbing the paddle and vehemently wrenching it from my hands. But this was unusual, and most of the time I was able to capture and bag a medium-sized caiman in 10 or 15 minutes.

The following morning I would weigh, sex, and measure the animals, and meticulously count the scale patterns. I marked the caimans by removing a different combination of tail crests from each animal with a razor blade, a coding system that would allow me to identify any individual I recaptured on future occasions. The rubber bands were a fast and safe way for releasing large caimans. After the animal had been marked, we passed a long rope through the bands, which allowed us to pull them off from a safe distance.

The most important part of my programme was to gather data on the nesting of the spectacled caiman, though I also hoped to find a nest of the now rare giant black caiman. The first step in gathering nesting information in a new area is to ask the local fisher-

Right and below: Amazonia is home for an amazing variety of animal life, both benign and dangerous to man. Right, sting rays armed with poisonous tail spines are a hazard in shallow, sandy areas. Below, a three-toed sloth, abundant throughout Amazonia, strikes a characteristic pose.

Bottom: An unusual sight — the nest of the now rare black caiman, a species that has fallen victim to encroaching civilization. When the nest is threatened, the female may attack.

men and hunters about nest habitats, the egg-laying period, and so on. Then begins the process of following up the leads, searching likely-looking areas for evidence of nesting. My Indian helpers had informed me that most caiman nest on *yamomo*, floating mats of *cortadero* grasses, ferns, and shrubs. The easiest way to investigate was to paddle around the edge of these floating meadows in hopes of spotting the female's path to the nest site. After a little experience I was able to differentiate a mother caiman's trail from those of the amphibious capybara, a giant rodent of 100 pounds or more, and the tapir, South America's largest land mammal.

My helpers, more agile than I, also climbed any trees close to the floating mats in order to scan them for the characteristic two-foot-high vegetation mounds. This was the best method of discovering nests and accounted for the greatest number we found. As a final check, we divided "good" habitats into quadrats and walked. These foot searches usually yielded a few more nests we'd failed to locate.

Walking through the *yamomo* was the one task that my Indian helpers embarked upon with the greatest reluctance. The grasses of the *yamomo* have sharp cutting edges, and my assistants never wore shoes while walking through forest or swamp. They were also, like most people, afraid of snakes, and *yamomo* is an excellent habitat for anacondas, a large constricting aquatic boa. During high water, the *yamomo* also shelters thousands of biting and stinging ants which form tightly clustered balls that are difficult to see in the dense, six-foot-high vegetation. There was also the possibility of falling through the mat into several feet of ooze, muck, and rancid water.

Another hazard was the female caimans themselves, who typically guard the nest throughout incubation. Although it appears that caimans have changed their protective behaviour in areas of intensive persecution, in virgin areas females will reportedly attack to protect the nest from any predators, including man. My helpers' fear was justified when they narrowly escaped the crushing jaws of a 10-foot-long black caiman which responded to the grunt-like distress call of her "pod" of hatchlings that they were busy catching.

In the past few years, fascinating information on the parental behaviour of crocodilians has surfaced. Behavioural patterns formerly attributed only to higher birds and mammals are being observed in these cold-blooded giant reptiles. During the hatching process, the female and possibly even the male facilitate the emergence of the young by rupturing the nest covering, which may have baked into a hard crust during the 80-day incubation period in the hot tropical sun. Caimans have also been seen to delicately pick up their young and carry them to the protection of the nearby water. The family group of young or "pod" remain with the mother for an undetermined period and their complex interrelationship probably enhances the young's chances of survival.

My short-term study was a relative success. I managed to locate and study 37 nests of the spectacled caiman and even five nests of the endangered black caiman. The reference collections of the ROM have been enriched as a result of my work in Bolivia. Several hundred caimans bearing my permanent mark are still leisurely cruising through the tepid weed-topped lagoons awaiting my return. My research answered a number of basic questions about the nesting and life history of the caiman, and posed just as many more which only another trip can solve.

Jim Lovisek, associated with the Department of Ichthyology and Herpetology at the ROM, has been interested in reptiles for the past 10 years. A love of wild places and exotic fauna led him to the Amazon in 1973, where he spent two years investigating the status and distribution of the endangered Amazonian manatee, the sea cow that may be one source of the mermaid legend. His present interest in crocodilians will be applied to developing a display for the ROM's gallery of world reptiles.

High waters wash away land and buildings along the shores of the Great Lakes. (Photos: Metropolitan Toronto and Region Conservation Authority)

Not Ours to Control

Living with Changing Lake Levels

Walter M. Tovell

It is hard to imagine what North America would be like without the Great Lakes. At least since the arrival of Europeans on their shores, they have been the principal transportation route to the continental interior. Today they provide a unique reservoir of fresh water for municipal and industrial use, a source of food both from their waters and from bordering lands, and hydroelectric power. They are an everyday part of our recreational and leisure life — as well as a convenient disposal site for ever-increasing quantities of sewage and industrial waste. They continue to be a major wildlife habitat.

The Great Lakes contain almost 20 per cent of the world's fresh, liquid surface water: enough to cover the whole of North America to a depth of three feet! It was the readily accessible fresh water that attracted such a large portion of the population of North America to their shores. Yet because of their magnitude the Great Lakes have been taken for granted in much the same way as the oceans. Only now are we learning that they can no longer be taken for granted, and that they are not a limitless resource.

Even though the Great Lakes constitute one of our most precious natural resources, their effects on our lives are not always benign. Like other natural phenomena, the behaviour of the lakes is sometimes unpredictable and beyond our control. In recent years, the problem of fluctuating lake levels has become one of increasing concern to property owners, industry, and government. High levels, for example, can cause flooding and erosion, with severe damage to property. In 1972-73, damage to the coastal zone became a matter of major apprehension. Many houses were lost or damaged through flooding or erosion. The loss of property during that year on the Canadian shores of lakes Ontario, Erie, Huron and Georgian Bay amounted to $19,000,000, and the loss of land was valued at $9,000,000.

The extensive damage in 1972-73 was caused by record or near-record high water levels. But low water levels — such as those experienced in 1964 — create other problems. When the water level of a lake is low, threats of flooding and erosion are minimized, and recreational areas along lake shores are enhanced because of the increased size of sandy beaches. But during low water shipping is adversely affected, principally because the water levels in the lakes also affect the levels in the shallower connecting channels. As an example, for a 1,000-foot, 65,000-ton capacity bulk carrier, only one inch of water more or less in a channel means a gain or loss of nearly 200 tons in its carrying capacity.

The grooved and moulded shores of Lake Superior are abundant evidence of its glacial origin.

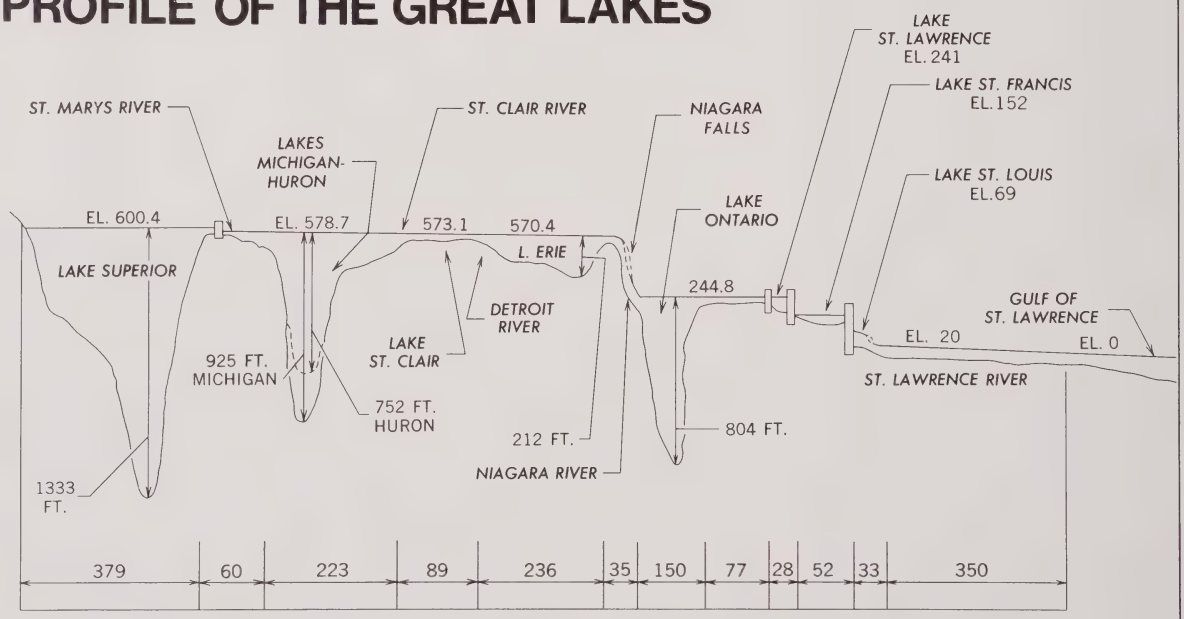
Many of the records of water levels in the Great Lakes go back to the year 1860. Over this long period of time, these records demonstrate that the lake levels have varied considerably. If we are to learn to live with and possibly to control changing lake levels, we need to understand what factors bring them about.

The Great Lakes were formed during the retreat of the last glaciers, which in the Great Lakes Basin began about 14,000 to 15,000 years ago. Over this span of time the configuration, water levels, and directions of discharge underwent constant changes in response to the changing positions of the ice-front, the pre-glaciation topography, and the tilting of the earth's crust. In establishing an equilibrium between their waters and the surrounding lands, the Great Lakes have continuously adjusted to their surroundings.

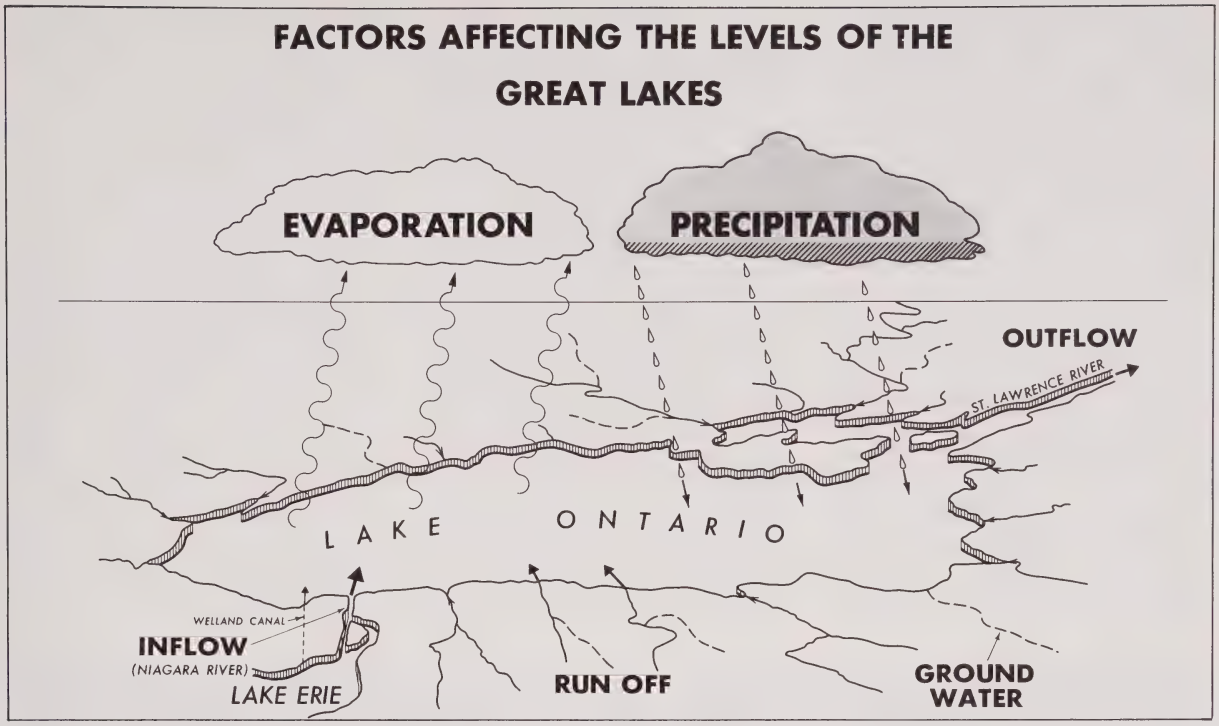
The configuration of the lakes is still evolving, principally through the processes of shore erosion and deposition, and partly as a result of continual crustal tilting. The tilting of the earth's crust in the area occupied by the Great Lakes is raising the northeastern shores, and consequently lowering the water levels on these shores. On the other hand, the water levels on the southern and western shores of the lakes are rising. In the long term, the levels of Lake Erie and Lake Ontario will increase and the level of Lake Huron will fall. These long-term trends are very gradual and hardly discernible to the average property owner. The maximum rate of tilt over the whole Great Lakes Basin is about 1.7 feet per century between Michipicoten, at the northeast corner of Lake Superior, and the west end of Lake Erie. Such a rate of uplift results in water level changes of only one to two inches per century.

Shorter-term variations in lake

PROFILE OF THE GREAT LAKES



ELEVATIONS OF THE LAKE SURFACES ARE AVERAGES EXPRESSED ON INTERNATIONAL GREAT LAKES DATUM (1955) AND ARE GIVEN TO THE NEAREST TENTH (1/10) FOOT. HORIZONTAL AND VERTICAL SCALES HAVE BEEN DISTORTED TO CONVEY VISUAL IMPRESSION.



levels are far more noticeable. The most familiar of these are seasonal changes. All lakes have higher water levels in summer than in winter. The average seasonal variation is less than two feet in each lake, although in Lake Ontario the maximum difference from a winter low to a summer high may be as great as 3.5 feet. Superimposed on these seasonal fluctuations are some extremely short periods of changes, of varying magnitudes. The most temporary of these are caused by winds that blow along the long axis of a lake and drive the waters to one end. Extreme examples occur on Lake Erie, in part because of its position with respect to wind directions, and partly because this lake is relatively shallow. Here, wind set-ups have caused differences of more than 13 feet in water levels between Buffalo, New York, and Toledo, Ohio. A second cause of temporary changes is seiches, which are changes in lake levels due to differences in atmospheric pressure at different ends of a lake. But although they affect lake levels, winds and seiches do not alter the *volume* of water in the lake.

The Great Lakes also exhibit long-term water level changes which cannot be accurately termed cycles, since the periods of these changes are not regular and hence not readily predictable. The intervals vary from 10 to 30 years. From 1969 through 1976, all lakes had unusually high levels, and in the mid-1960s the lakes generally experienced low levels. In the late 1940s and the early 1950s the lakes were also high, reaching a peak in 1952 before moving to the low stage of the mid-1960s. The magnitudes of these long-term variations are three-and-a-half to six times greater than the average seasonal variations. It is these long-term variations that cause the property damage during high water. The search for the cause of these fluctuations has involved studies of the climate of the Great Lakes Basin and the hydrology of the lakes.

The total area of the Great Lakes drainage basin is 295,800 square miles, of which 94,680 square miles or 32 per cent is occupied by water. All lakes except for Lake St. Clair and Lake Erie have depths that extend below sea level. It is important to realize that because of the very large water surface of the lakes, even small changes in levels account for enormous quantities of water. The seasonal and long-term changes recorded by measuring gauges on any lake indicate an enormous increase or decrease in the volume of water in that lake.

In each of the lakes, the volume of water is dependent upon the amount of precipitation (snow and rain) over the lake, the amount of water delivered by rivers and streams flowing into the lake, the inflow from the lake above, the flow of groundwater into the lake, and any artificial diversion into the lake from outside the basin.

The gain in water is lost by counteracting processes. These processes are evaporation, outflow, either natural or through artificial diversion of water to other drainage basins, and withdrawal for municipal and industrial use. Compared with the total volume of water in the

lakes these latter two uses at present are very minor, though they may increase. In the Great Lakes system, Lake Superior has no large inflow, since it is the uppermost lake of the system. It does receive waters from two small diversions from the Hudson Bay drainage, but about 88 per cent of Lake Superior's supply of water comes from precipitation.

Although we can measure the outflow of a lake we can only estimate how much water is lost through evaporation, because of the many factors that influence this process. It has been estimated that twice as much water evaporates from the Great Lakes as flows down the St. Lawrence River. Calculations suggest that for Lake Superior, about 55 per cent of the new waters return to the atmosphere, while for Lake Ontario, the evaporation is thought to be almost equal to the precipitation. By way of further contrast, about 86 per cent of the waters stored in lakes Erie and Ontario come from inflow from the upper lakes.

The principal factor that determines inflow, outflow, and evaporation — what is known as the "water budget" of the lakes — is climate. The rate of precipitation and evaporation is determined by long-term climatic trends over the whole watershed. A single dry spell or rainy season has little effect on lake levels. It is only when precipitation is persistently above average or persistently below average for a number of years that lake levels are significantly raised or lowered.

The Great Lakes, in fact, are naturally well-regulated bodies of water, because the lakes have relatively small restricted outlets through which their waters are discharged. The outflow from lakes Michigan-Huron through the St. Clair River, Lake St. Clair, and the Detroit River, into Lake Erie, depends on the levels of the upstream and downstream lakes. Similarly, the outflow of Lake Erie to a great extent governs the level of Lake Ontario. The efficiency of the system is reflected in the relatively small variations between winter and summer flows through the connecting channels. In fact, maximum flows of the outlet rivers are only two or three times their minimum — in comparison, for example, with the Mississippi River, whose maximum flow can be 35 times greater than its

Cliff recession, aggravated by periods of high waters, poses a threat to homeowners along the Great Lakes.

minimum. This natural regulation of outflows is the reason for the *relative* stability of the lake levels.

Still under debate is the effect of high waters in the upper lakes on the levels in the lower lakes, and particularly the effect of the discharge from Lake Superior on the lower lakes of the system. The outflow from Lake Superior is controlled by dams at Sault Ste. Marie. It would seem a simple matter to use these and other dams to influence the levels of the lower lakes by either withholding or releasing waters from the upper lakes, especially Lake Superior. During the high waters of 1972-73 the water discharge through the dams at Sault Ste. Marie was reduced, and this did in fact lower the water levels on lakes Michigan-Huron and Erie slightly. Calculations suggest, however, that perhaps as many as three years are required to produce any significant effect on the downstream lakes, other factors being equal.

The waters of Lake Ontario are controlled by dams along the St. Lawrence Seaway at Cornwall, Ontario and Massena, New York. The regulation of the discharge must take into account not just the levels of Lake Ontario, but also the levels of the St. Lawrence River at Montreal Harbour. It is interesting to note that during the high waters of 1973, for all of the months of June and July the outflow of Lake Ontario was allowed to exceed by a considerable amount the maximum flow ever recorded in the St. Lawrence River before the Seaway was built. This increased outflow diminished the water level in Lake Ontario by just over one foot.

It is evident, then, that our existing methods of control can alter lake levels only minimally. In response to the problem of fluctuating lake levels, the International Joint Commission, through the International Great Lakes Level Board, carried out a thorough study from 1964-1974 in order to ascertain the feasibility of further regulating any or all of the unregulated Great Lakes. The general conclusion was that the cost of the structures that would be required to regulate water levels on all the lakes would be far in excess of the benefits that would be gained, although modifications in the regulations that govern the discharge through the control structures at Sault Ste. Marie and on the St. Lawrence Seaway can be made to

A view of Ashbridge's Bay Landfill, off Toronto's Greenwood Race Track. The points are armoured to prevent erosion, and the shape of the landfill is scientifically designed to account for wind and wave directions.

reduce extreme water levels. The conclusions are clear. Our financial resources and technical ability to control the levels of the lakes are strictly limited. Instead of seeking to control, we must develop new policies in order to live with the lakes more comfortably.

The policies that are required to meet the industrial, municipal and personal requirements of the 35 million people who live around the lakes must take into account the reality of fluctuating lake levels. The first step is to understand the causes and effects of changing lake levels. In addition, we require improved and enlarged data-gathering facilities in order to develop better forecasting procedures. Because cyclical high water is a constant factor, we must identify and delineate those lands susceptible to erosion and flooding, called hazard lands. But even with better methods of prediction, the socio-economic policies we need with respect to these lands are not easy to develop. Should, for instance, public funds be used to buy private property on which a house is about to topple over a cliff, or be irreparably damaged by flooding? In the area of policy development, the answers are still unclear.

People who live by the sea accept and adapt to the ocean's tides. A similar acceptance of fluctuating lake levels must be developed by those who live by the lakes, and by those agencies of government with jurisdiction over lands that border on lakes. Today, we live most of our lives within the stable confines of the city, where even severe storms do little to alter our behavioural patterns. In such environments we become accustomed to consistency, and so it seems that when we move out of the cities we demand the same consistency from the natural environment. But nature does not work that way. The fluctuations in lake levels are natural phenomena governed by natural laws. It is only by understanding them and working with them that we can live with the lakes.

Data for this article have been gathered from publications of the International Joint Commission, The Great Lakes Basin Commission and the Canada-Ontario Great Lakes Shore Damage Survey.

Dr. Walter M. Tovell, during his tenure as Curator of Geology at the Royal Ontario Museum, participated in scientific cruises for the Great Lakes Institute, University of Toronto, with the objective of learning more about the history of the Great Lakes. Recently he has worked with the Ministry of Natural Resources of the Province of Ontario in developing Great Lakes awareness programmes. A past Director of the Museum, Dr. Tovell is now Head of the Ontario Museums Advisory and Support Services, and acts as a consultant to museums across the province.

A massive land slip along Toronto's Scarborough Bluffs.

The Growing Collections

The European Department continues to add to its already highly important collection of Renaissance and Baroque bronzes. Among the most notable of recent acquisitions is a superlative lost-wax gilt bronze statuette of "Christ Falling Beneath the Cross". This poignant figure is attributed to Alessandro Algardi (Bologna 1595—Rome 1654), and is the Museum's first example of an Algardi composition in any medium. It is as such an acquisition of unusual importance. It is the ROM's second example of a bronze connected with the Roman circle of Baroque classicists, who provided an alternative to the more highly theatrical style of Bernini. The ROM's other example of Roman Baroque classicism is a small bronze group of "Jupiter and the Infant Bacchus", attributed to François Duquesnoy (illustrated and described in the Fall 1976 issue of *Rotunda*).

The attribution of the figure to Algardi derives from Dr. Jennifer Montagu, who has shown its stylistic relationship to an Algardi "Baptism of Christ". The composition, which is known in both patinated and gilt bronze versions in Vienna, Frankfurt, Rome, and Toledo (Spain), as well as in plaster, had been previously attributed to anonymous Italian and Austrian sculptors. However, it can be compared not only with the Algardi "Baptism of Christ", but with other Algardi works such as the gilt bronze and plaster reliefs of "Saints of the Society of Jesus" in the "Gesu" church in Rome, and the terracotta "San Nicola" in the collection of the Palazzo Venezia, Rome. The treatment of drapery details and the striations of the base are similar to details of other Algardi works such as the terracotta relief of the "Madonna and Child with St. John" in the Church of S. Maria in Vallicella, Rome. The mat surface of the ROM statuette also has parallels with works connected with the Algardi workshop, such as a relief of the "Flight into Egypt" in the collection of the Victoria and Albert Museum.

K.C.K.

The West Asian Department has recently acquired two unglazed pilgrim's flasks with press-moulded decoration. One has a 12-pointed star design which probably alludes to the 12 divisions of the zodiac, a common good-luck symbol in the 12th-13th century in Islamic Iran and Mesopotamia. From the same period, the department has received a cast bronze faucet with lion-head spout and bird handle. It may have come from a public fountain or bath house, 12th-13th century Iran. L.G.

The Far Eastern Department is fortunate to have acquired in March a small Japanese Buddhist figure of the Bodhisattva Jizō. Jizō is among the most popular of Buddhist deities: he first appeared in Japan in the 8th century as an Esoteric deity. In Sanskrit he is known as Kshitigarbha, Matrix of the Earth, and is paralleled by Kokuzō, Akasagarbha, Matrix of the Void. After the end of the Heian period (794-1185) Jizō came to enjoy great popularity and by the Muromachi period (1334-1573) was well established among the most prominent deities represented in sculpture. Both in roadside shrines and in established temples, from the 14th century on Jizō is a ubiquitous presence. He has received the devoted worship of the common people as the protector of the powerless, especially children.

The figure is constructed of multiple wood blocks and is hollow. Garment details are rendered in paint over a kind of gesso. The eyes are inlaid crystal. The carving of the garments and the expressive qualities of the face suggest that the figure was completed in the last years of the 14th century or the first decades of the 15th. This figure almost certainly saw service in a local shrine, as attested by the number of strips of paper inside the figure bearing the names of children whose benefit their parents sought to secure. The figure expresses the benevolence appropriate to Jizō's role as the guardian of the weak and displays as well a sculptural excellence which stands comparison with many of the finest works of the period. T.Q.

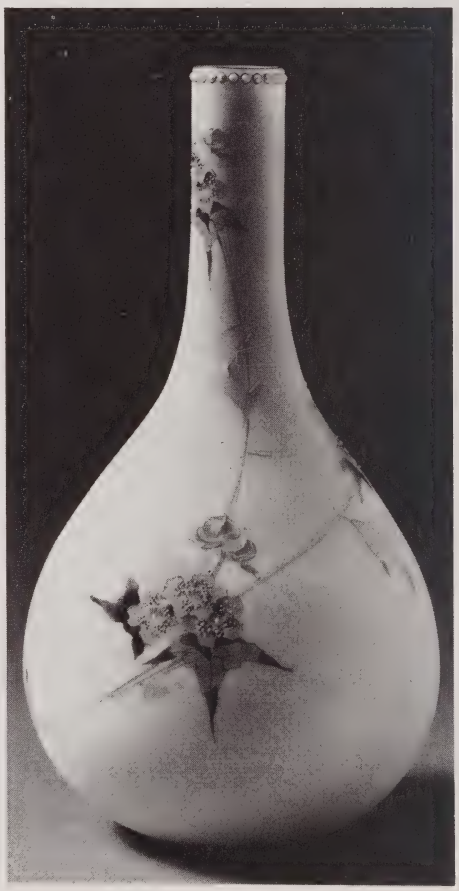
Included among a number of objects recently given to the West Asian Department are two Mesopotamian mould-made baked clay figurines with plaque background, one a nude female and the other the upper body of a male worshipper offering a kid. The female is a type found over a wide area and dates to the Third Dynasty of Ur (c. 2100-2000 B.C.) or to the slightly later Isin-Larsa Period (c. 2000-1800 B.C.). Its distinctive features are hands clasped under the breasts, shoulder-length hair curled at the ends, and a single or multiple strand necklace. The male votary is also probably Babylonian, and dates to the late 3rd millennium. He has a tunic and shawl, a round turban, and a long beard.

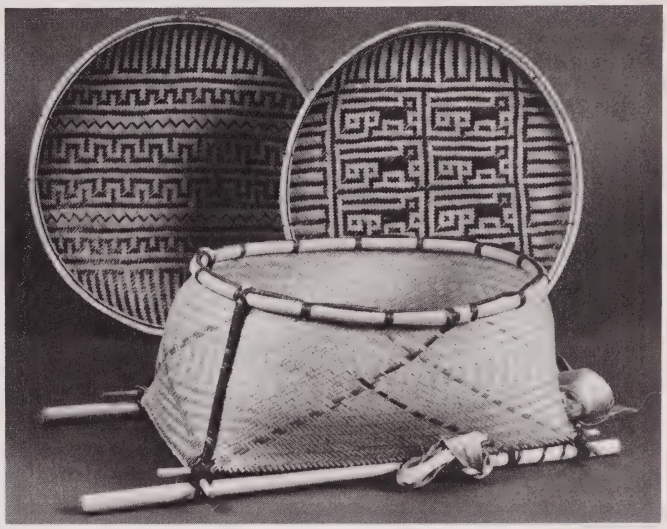
Curiously, though clay figurines are common finds, their purpose is largely a matter of speculation. One explanation is that they were connected in some way with magic or religion, representations perhaps of minor "personal" gods and goddesses, and had an amuletic character by means of which the possessor gained protection in life. A second explanation has them as purely human in character, in poses of submission towards the gods. W.C.P.

An unusually well-documented and prepared collection of over 1,400 insects from the Geraldton region has been obtained from Mr. Walter Plath. A wide variety of species is represented as pinned and spread adults, and carefully reared series of immature forms permit precise association of larvae and adults, a major task in contemporary entomology. The value of the collection is further enhanced by a set of colour photographs of the various life history stages. This material represents a significant addition to Museum research collections from an area of Ontario not previously well represented. Left: A fritillary of the genus *Boloria*. D.B.

During the 1880s, a growing interest in unusual hand-made "objets d'art" led many manufacturers to produce special "art" lines. These were objects designed, made, and decorated to appeal to discriminating buyers. The so-called "art glass" is very characteristic of this type of manufacture. British and American firms vied with one another to introduce new varieties of glass almost annually, and used hand-worked decoration and chemically created colours to produce new and unusual effects. One of the more successful types was "Burmese glass", introduced by the Mount Washington Glass Company, New Bedford, Massachusetts, about 1885.

The Museum is extremely fortunate to have received two examples of Burmese as a recent bequest from Miss H. Violet Shepley of Toronto. The vase illustrated here shades from pale yellow to pinky-peach at the neck and has a mat finish created by hydrofluoric acid. Against this pastel background so typical of the period, the company decorating department has added asymmetrical enamelled floral decoration. The piece is a significant addition to our relatively small collection of American decorative arts. C.P.K.





In February, the Mammalogy Department completed the purchase of the private collection of Dr. Russell Mumford, Professor of Zoology at Purdue University. Totalling 1,700 specimens of mammals, this world-wide collection contains 1,600 bats representing 95 genera and 175 species, and 100 other small mammals. Dr. Mumford accumulated this superb collection through extensive field studies in North and South America and Africa and by exchanges and purchases with scientific collectors from around the world. The bat material is a significant addition to the Museum's already outstanding collection of this group of mammals. Moreover, some specimens collected from tropical rain forest areas in the New World, Africa, and Asia undoubtedly will be important for future generations of biologists and naturalists because they represent a permanent record of the species inhabiting these regions. Unfortunately, much of this tropical rain forest is being rapidly destroyed and some species of mammals that inhabit these forests could become extinct by the end of the century. D.N.

Despite the population increase in many parts of the world, traditional aboriginal cultures and ways of life are on their way to becoming extinct. If their descendants should ever wish to return to a more traditional pattern of culture, ethnologists in museums, as the guardians of many heritages, will become instrumental in the process of reconstruction.

One of the areas affected by rapid culture change is the southeast of Venezuela. Roads are bringing a different lifestyle into formerly isolated Amerindian areas, and are changing not only the ways of life but also its means. In a joint effort of the ROM's Ornithology and Ethnology departments and the Museum of Natural Sciences in Caracas, Drs. J. Barlow and H. Fuchs, and Mr. J. Dick and Mr. Julio Barbera ventured into the southeastern corner of Venezuela in November and December, 1976. One of the many accomplishments of this field trip was the acquisition of a collection of traditional art and crafts of the Pemon and Deukwana Indians.

We thank the Board of Trustees and administration of the ROM for their valuable help, and extend our gratitude to the Venezuelan authorities of the Ministerio de Agricultura y Cria, and particularly the Museo de Ciencias Naturales (Consejo Nacional de Cultura) for the hospitality, active cooperation, and the granting of the necessary permits that made the endeavour successful. H.F.

La Toile de Jouy

The ROM Helps a French City Recover its Heritage

John E. Vollmer

Left: The preparation of the Oberkampf textiles for loan to France was a delicate and time-consuming task. Here, the mounted textiles are prepared for framing.

Below: This copperplate printed cotton was designed by Jean-Baptist Huet and marked "bon teint" (colourfast), the Oberkampf factory guarantee of quality. 1780-90. From the Harry Wearne Collection.

Throughout the late 18th and early 19th centuries the woodblock and copperplate printed cottons produced at the city of Jouy-en-Josas in France spread the name of Jouy across the fashionable world. Manufactured by the Oberkampf textile printing factory under the direction of Christophe-Philippe Oberkampf, the *toile de Jouy* (cloth of Jouy) became synonymous with quality printed fabrics. Today the term is still used to describe fabrics with large-scale monochrome scenes, an Oberkampf specialty.

Last year, Monsieur Jacques Toutain, the mayor of Jouy-en-Josas, came to Toronto to see the Museum's splendid collections of French printed textiles. He was particularly eager to see the fabrics which were made at Jouy by the Oberkampf factory, of which the ROM has many examples. Monsieur Toutain spoke with pride of a recently renovated 18th-century house which would serve as a new city museum, and of his hopes for drawing national and international attention to his city. He had come to ask the assistance of the Royal Ontario Museum in celebrating the opening of the new museum with an exhibition which would illustrate an important aspect of his city's past — the Oberkampf textile printing factory.

It may seem strange that a Frenchman should come to Toronto to study his own heritage; but the ROM's collection of 18th- and 19th-century printed textiles is one of the foremost holdings of such material in the world. The Harry Wearne collection, given to the Museum in 1934 by his widow, includes over 650 printed textiles. Harry Wearne (1852-1929) was an English designer first of wall papers and later of printed textiles. His collection includes 250 rare examples of woodblock printed cottons that give a comprehensive picture of work done at Jouy and Nantes, as well as other important printing centres in 18th-century France. In

The exotic design of this woodblock printed cotton was inspired by Indian chintz. The pineapple motif was copied by Oberkampf from the imported fabrics, although it originally came from a European botanical source. 1780s. From the Harry Wearne Collection.

addition, there are over 50 copperplate printed designs, many of which are very rare.

Printed textiles played an important role in the economic history of France. Initially, textiles with printed patterns copied a luxury imported fabric, Indian chintz. Chintz, a painted and dyed cotton, was imported into Europe during the 17th and 18th centuries, and from its introduction Europeans were wildly enthusiastic about this brilliantly coloured, completely washable fabric. Prior to this time washable colours on printed textiles had been unknown. The fashion for these imported chintz fabrics stimulated local imitation and led to technological improvements, including colour-fast dyes.

The popularity of Indian chintz and its French imitations seriously threatened the market for woven goods. As a result, the French wool weavers and silk manufacturers successfully lobbied against the importation of chintz and had the local production of printed fabrics banned in 1686. However, the passion for the forbidden fruits of the East and for their equally illegal domestic counterparts was so deeply rooted that smuggling became widespread. Not only were the prohibitions impossible to enforce, but printed textiles had come to be viewed as an important source of national revenue. When the bans were lifted in 1759, the great period of textile printing in France began.

In that very year, Christophe-Philippe Oberkampf, the son of a German textile dyer, founded a textile printing factory at Jouy-en-Josas on the road between Paris and Versailles. This location was advantageous for obtaining the patronage of the French court, and in 1783 the factory was appointed as a *Manufacture Royale*. Oberkampf was a skilful manager. He continually improved production by adopting the latest technological developments and inventions at his factory. He brought together the very best designers, carvers, engravers, and printers to produce the textiles which made his reputation and fortune. In 1787 he received letters of nobility from Louis XVI.

Despite royal patronage, the factory successfully weathered the stormy years of the Revolution, thanks to Oberkampf's skilful administration and his financial support for the cause. Following the Revolution, Napoleon sought Oberkampf's advice regarding industrial matters. Oberkampf died in 1815 and the factory was carried on until 1837 by members of his family, none of whom had Oberkampf's astute business ability. The factory finally closed its doors in 1843.

Following the mayor of Jouy's visit to the ROM last year, 22 textiles made by the Oberkampf factory were selected to travel to France. Because these textiles were fragile and the Jouy museum did not have a curatorial staff, it was decided to have the pieces mounted and framed to minimize

the risk of damage. The lengthy and delicate job of conserving the textiles was carried out under the direction of Izabella Block-Bolten, ROM textile conservator. Each fragment was cleaned, blocked, sewn to a fabric support, mounted, and framed.

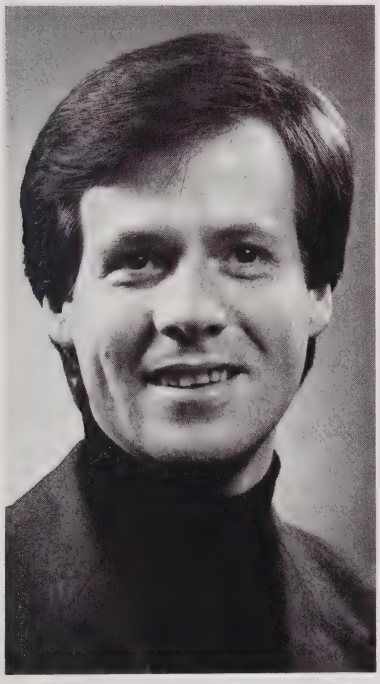
Before this work was begun the pieces were carefully recorded and their condition documented. Each textile required a cotton backing to support it in the frame, and eventually seven different fabrics were acquired and prepared to meet the aesthetic requirements of the pieces. At the same time, the pieces were prepared for hand washing to remove nearly two centuries of accumulated dirt. As a piece was cleaned, it was blocked on a large table to dry.

Then the textiles were matched to their backings and stacked to save space. Each was attached to its support with short lines of vertical and horizontal stitches; then the edges of the piece were fastened, and finally, damaged areas were attached to the support by means of very fine, soft silk thread. In some of the pieces, black outlines which had been printed with dyes using an iron mordant had rotted the fabric. These very "lacy" fragments required many hours of patient stitching to support the fabric safely. Some fragments were composed of several pieces which were carefully unstitched and reset to improve their appearance and to show the pattern more effectively. Six of the textiles were larger than the largest frame size and had to be adapted to the frame. After much discussion it was decided to roll excess fabric rather than fold it and risk further damage.

The textiles were then attached to acid-free board with a criss-cross netting of heavy cotton thread, and removed to the preparators' workshop. There, they were placed in aluminum frames with an ultraviolet-absorbent plexiglass. More than three months after the conservation work had begun, the 22 textiles were flown to Paris in three padded crates built by the carpenters' shop.

The ROM pieces were installed in Jouy with fabrics and documents from five French museums and the exhibition "Toile de Jouy" opened on March 5, 1977. Reports from France attest to the success of the exhibition and the enjoyment of many visitors. Now back in Toronto, the textiles are on display in the third-floor Rotunda of the Museum from September 8 through October 17, and plans are underway to send them as a travelling exhibition throughout Canada.

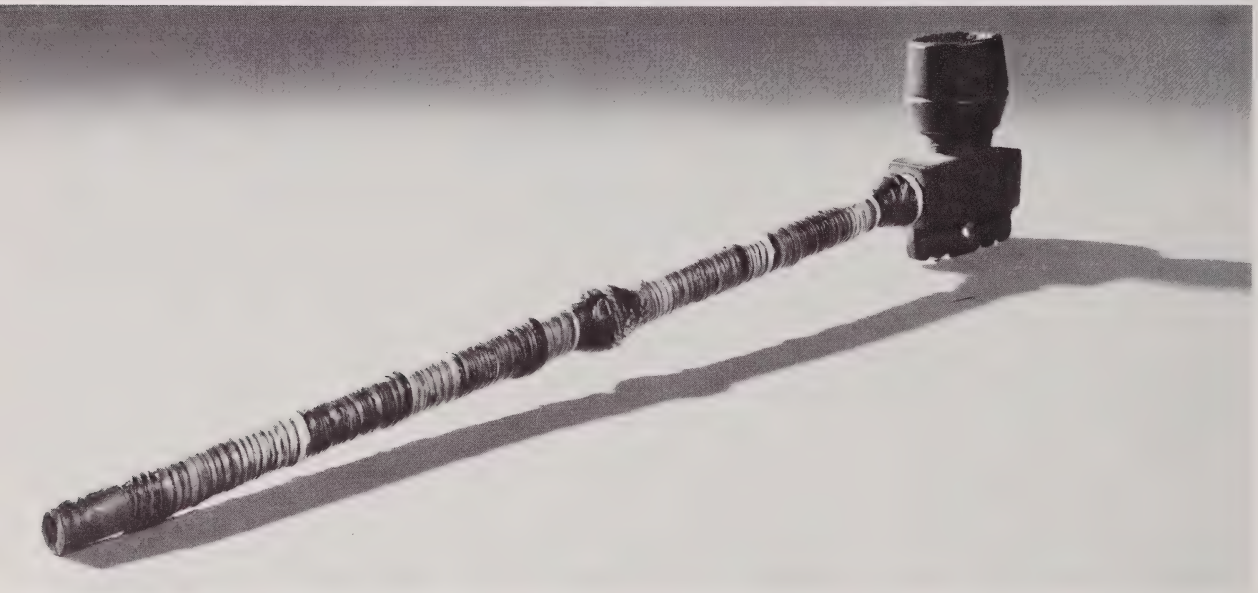
The story of the Jouy loan underscores the importance of the 1934 gift of the Harry Wearne Collection. The collection is the source for original research that has made significant contributions to our knowledge of the economic, cultural, and artistic developments of Europe. The ROM has had the honour of assisting the city of Jouy-en-Josas with its successful exhibition. Several conservation students have gained valuable training by helping in the preparation of the loan. Many people in Canada will have an opportunity to learn from this unique travelling exhibition; but perhaps most importantly, the Museum has gained international goodwill for all Canadians.



John Vollmer, Assistant Curator in Charge of the Textile Department, joined the Museum staff in 1968 and became head of the Textile Department in 1975. His primary area of interest is Oriental textiles, including East-West trade goods of the 16th, 17th, and 18th centuries, some of which the Oberkampf factory attempted to copy. Last year, besides organizing the Jouy loan, he was responsible for the first major showing of the ROM's Chinese costume collection since 1946 in the exhibition "In the Presence of the Dragon Throne".

Right: This chair back and seat cover are a fine example of European influence in Native art. Micmac, 1840-1880?

Below: The stem of this pipe is wrapped in quills with sinew. The bowl is made from slate; the stem is of cherrywood. Cree, Saulteaux, 1870?



A Unique and Little-Known Art

Native Quillwork of Canada

Alan McClelland

Photographs by Brian Boyle

Quillwork, a unique art practised by the North American Indians, has probably adorned sacred and ritual items since pre-Columbian times. Articles worked in quill are far more rare than the more familiar beadwork, and less is known about their origins. The exhibition "Quill Embroidery by Native Peoples of Canada", a historical view of quillwork from about 1800 to the present day, presents an unusual opportunity to see this little-known art.

Peoples of the foothills of the Rockies, the Subarctic, and the Eastern Woodlands (all habitats of the porcupine) executed elaborate quillwork. They also traded quills to the peoples of the Plains. On the Plains, quilled garments such as shirts and robes were a sign of rank and wealth, to be worn by the leading warriors of a tribe on ceremonial occasions. The quilling itself was surrounded by elaborate ritual. Before the making of each piece a feast would be held, and after it was completed a high-ranking warrior would count coup (ceremonially recount his war exploits) or otherwise signify his respect for the piece.

Highly skilled women were chosen to quill the most important items, such as those used for the burial of a chief, for a Sundance, or for a present to another tribe or prestigious outsider. The women who quilled were accorded great honour. Plains Indian women formed "guilds" and compared quillwork,

and only certain designated members quilled the sacred and religious items used by societies within the tribe. These items of ritual, such as medicine bags, often were ornamented with special designs that would not be used for any other pieces, and the designs themselves were handed down through time. Even today, some designs are reserved for specific objects, and may only be executed by certain women.

The preparation of the materials was a long and laborious process. First the quills were removed from the animals and sorted according to size and length. They were dyed with natural colours, and more recently, with purchased dyes. Prior to working them, the women would moisten the quills in their mouths to soften them. Next they were flattened by being drawn out of the mouth from between the teeth. Virtually every object could be quilled, and a wide variety of styles, colours, and techniques was employed. Quills could be plaited, loomed, cross-stitched, or woven to cover almost any surface. Pipe stems, hair ties, moccasins, shirts and leggings, belts, straps for tumplines or for baby slings, and boxes made of birch bark were all ornamented in representational or geometric designs.

The preparation of the other materials was equally arduous. If the quillwork was to be done on skin, the animal hide had to be defleshed, stretched, scraped, soaked, treated, and slowly dried near a fire. A proficient worker might take a week to quill two rosettes for a warrior's shirt, like the one on the shirt illustrated in this article, and several women might need a month to prepare the hide and quills for a single shirt.

Native quillwork can conveniently be grouped into three broad divisions: Eastern (east of Manitoba), Plains, and Athapaskan (the northwest). Even so, it is often difficult to identify particular styles and techniques with a specific tribe, not only because most surviving quillwork is undocumented, but because many bands came into frequent contact

Above: Quilled and embroidered gloves probably made for a white person. The trim is marten fur. Athapaskan, 1906.

Left: This short riding shirt is typical of the cut and style used by the Blackfoot about 1780-1800. It has quilled strips along the arms over the shoulder and two quilled rosettes, one on the front and one on the back. Most of the fringe is also quilled.

Opposite page: This pipe bag has quilled panels on front and back, with quilled rawhide fringe at bottom. Blood, 1895-1912.

with one another and borrowed motifs or methods of construction.

Quills could be worked in more intricate designs with the use of a loom, and the loom beadwork techniques and Woodland designs of the Plains Ojibwa of southwestern Manitoba were borrowed by the Cree to the west. The Assiniboine, in western Alberta, used methods of construction borrowed from the Sioux to the south, and later incorporated large block patterns into their designs that were similar to the Blackfoot and older quill patterns. In general, Plains quillwork is noted for its geometrically simple embroidery, often quilled in block form. By the 1860s many tribes had adopted characteristic identifying colours. The Crow, for example, used lavender, and sometimes light blue as a background.

Frequently the cut, material, and other ornamentation of a garment can tell us more about its origins than can its quillwork alone. Antelope hide, for instance, was commonly used in southern Alberta, while tribes of the foothills used the hide of buffalo calves or mountain sheep, animals indigenous to that area. Styles of beading help in the identification of quillwork pieces made after 1840, as different tribes made characteristic use of glass beads for borders and highlights. Sioux garments are often plentifully adorned with hair fringe.

In Canada, the ubiquitous Hudson's Bay Company provided many of the materials for garments made after the 1870s. Plains Indians often embroidered the red military cloth obtained in trade from the company, and the Blackfoot and Plains Cree began to use cotton or mattress thread, usually acquired as gifts, instead of sinew for sewing. In the United States, where suppliers of trade goods insisted on payment for such items, the Sioux continued to use sinew.

The European presence in North America profoundly affected all aspects of Indian life, including the practice of traditional arts. The Plains Cree and Athapaskans began to quill more intricate designs by adopting European floral motifs, and after European contact these and other representational designs became increasingly common. The introduction of European trade goods, particularly beads, brought about a considerable decline in the use of quills for ornamentation. Around the middle of the 19th century, beadwork became more popular than quillwork among most tribes, probably because it allowed the maker more control of the material and could be used for

These Sioux moccasins, made in 1937, show traditional patterns. A beaded border surrounds the bottom, while the vamp section is fully quilled. On the outer side are three lines of quillwork.

finer, more delicate designs.

With the disruption of Indian life in the 19th century, quillwork lost most of its sacred associations. Through wars, raids, and forced migrations many pieces were lost, and with them, the old sacred designs. The breakdown of tribal life also forced a change in social priorities. No longer were time and resources allocated to quillwork, nor were the feasts and ceremonies given which traditionally honoured it. Eastern quillwork, particularly on hides, began to disappear in the middle of the last century, although quilled bark boxes are still made by contemporary craftsmen. Quilled work by Plains tribes has diminished greatly since 1900, although there is some current revival in the art. Athapaskan quillwork was not affected to the same extent, and the recent ROM display of fine quillwork from the Fort Providence or Simpson area is an example of renewed interest and fine craftsmanship. Modern quillwork is often undertaken at the urging of dealers and collectors, who have helped revive the demand for this ancient art form. Contemporary artists still use traditional designs, though just as often they rely on individual inspiration.

Because quilled items are made of organic materials their life span is likely to be short. Most have rotted or simply disappeared over time, lost in warfare and dispersal. Those pieces that do survive are usually difficult to date precisely, and their place of origin undocumented. Often, though, a piece may be traced back to a particular tribe with the help of other information we have about tribal customs and styles. In the old days, the individual style and ornament of a tribe were often well known. The appearance of a man's horse, his clothes, or even his camp was sufficient to reveal what band he belonged to. This information was passed along from person to person, and white people who lived or traded with Native people often brought back gifts, souvenirs, and practical objects which could be attributed to a specific group. Today, all of this documented material is sought after as clues to the classification and dating of the many other artifacts of which little is known.

The most recent records come from the Athapaskan area of Canada's northwest. Here, missionaries collected articles of clothing, toys, hunting tools, and early commercial goods, often recording the place of origin or even the maker. Relatives of the old Hudson's Bay Company factors, many of whom still live in the area,

Left: This Cree knife case has been quilled at both ends. The fringe is quilled and looped at the bottom. Five different styles of quillwork have been used in all. 1840.

Below: The clothing on this china doll is adult clothing typical of the time, and shows three different quill styles. Athapaskan, 1906.

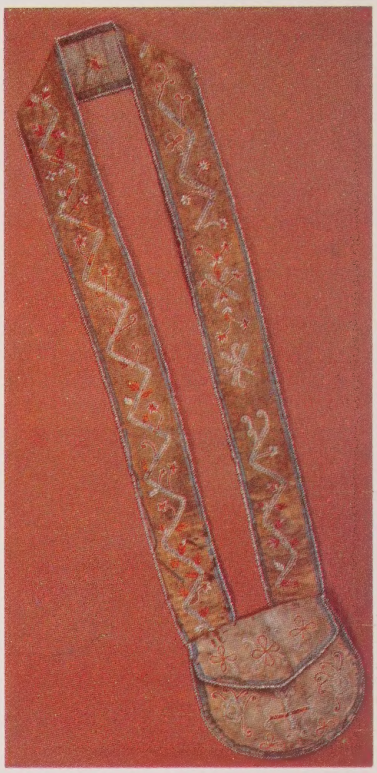
can also help piece together information. In fact, the fur companies provide some of the most valuable records. Operating in the northwest since the late 1700s, they collected a good deal of material which was later sent to England and Scotland. Today much of it is in the Royal Scottish Museum, which has a notable collection of quillwork.

The ROM's outstanding quillwork collection includes early Great Lakes, Plains, and Athapaskan quillwork, as well as fine contemporary pieces. Most of the Eastern material is comprised of quill boxes, which range in origin from the Atlantic coast to central Ontario. An outstanding and very rare example of Eastern work is an Iroquois prisoner's belt, which would have been tied around the neck or used to bind the hands of a captive. It is made of plaited horsehair with quillwork in bright orange, a characteristic Iroquois colour, and is ornamented with copper cones. Like most other quillwork it has no documentation, but it probably dates from between 1750 and the early 1800s, a period from which there is little surviving material. Another unusual item is a well-preserved bullet pouch said to have once been owned by John Tecumseh Henry. The pouch is made of white, home-tanned deerskin and is a fine example of floral quillwork. A third outstanding example of Eastern material is a Southeastern Ojibwa belt with beaded edges and tassels. Probably made around 1820, it was handed down through the Jarvis family and eventually donated to the Museum.

The core of the ROM's collection is the Plains material, which includes a vast array of styles worked on every conceivable article of clothing. A series of Plains shirts made from 1800 to 1900 illustrates a century of changing styles, and other articles demonstrate the relationship between quillwork and beadwork designs. Many of the Plains articles once belonged to noted warriors and chiefs.

The exhibition "Quill Embroidery by the Native Peoples of Canada", which opens October 17 at the ROM, includes these and many other pieces, over 180 in all. It not only documents tribal affiliations and dates, but also explains the use and historical significance of each object and demonstrates influences and changes in style. The work of every Native group now practising quillwork is also represented. This exhibition is a unique opportunity to see and compare the finest examples of this ancient, almost-lost art, and through that art, to enrich our understanding of the way of life of the peoples who made it.

This bullet pouch, said to have once been owned by John Tecumseh Henry, is a fine example of floral quillwork.



Alan McClelland was born and lives in Toronto. He collects and deals in traditional Native art, both antique and contemporary, and works with Native groups to help revive these art forms. He has always been interested in the way of life of Native peoples, and is himself an occasional guide, hunter, and trapper. As a volunteer worker with the Museum's Ethnology Department, he is helping to document the Plains material in the collections, and is involved in preparations for the exhibition "Quill Embroidery by Native Peoples of Canada", which opens October 17 in the Ethnology Galleries.

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